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THE *Refrigeration* Industry

DECEMBER, 1945

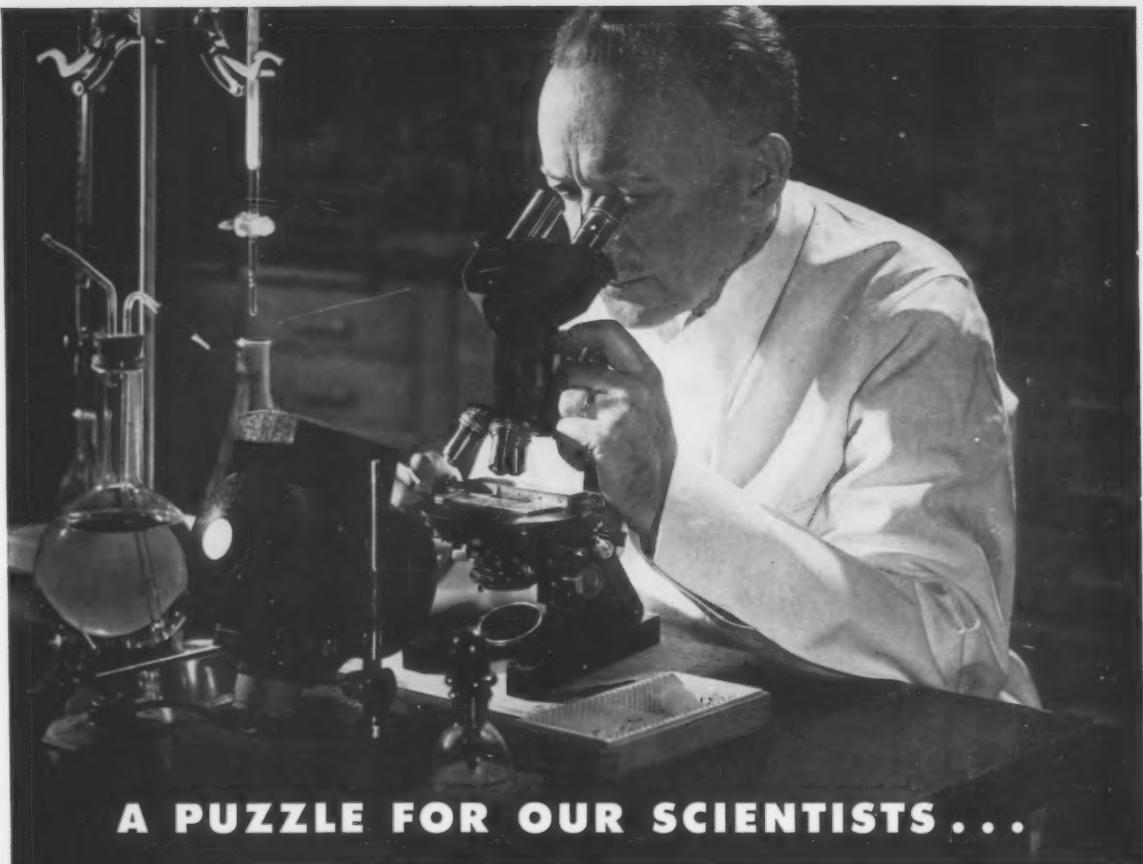
INSTALLATION
MAINTENANCE
MERCHANTISING

AIR CONDITIONING
MACHINERY



Greetings!

IN THIS ISSUE: { Cold Turkey Selling...So You Think You Improvised!
Sub-Cooling - - Useful Tool...Evaporative Condensers
Basement Locker Plant...Refrigeration in Atom Town



A PUZZLE FOR OUR SCIENTISTS . . .

Weatherhead

Firsts

Solving Problems
for Industry

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ERMETO FITTINGS

★
Q-A HOSE END
FITTINGS

★
BRAZED STEEL
FITTINGS

★
HYDRAULIC BRAKE
LINES AND
BRAKE FITTINGS

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FIRE-RESISTANT
HOSE ASSEMBLIES

★
THE WEATHERHEAD
T-RING PACKING



HOW TO SAVE YOU A PENNY

HAVE you thought much about performance of small parts in new peacetime products—and how much these parts cost?

Countless times since 1919 Weatherhead has been assigned the job of saving "a penny a part" for a manufacturer—and has solved the puzzle and delivered a finer part in the bargain. At Weatherhead this kind of thinking begins at the beginning—in the laboratory—where a steadily growing staff is trained to consider engineering, production

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**FREE: Write on
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Weatherhead facilities and
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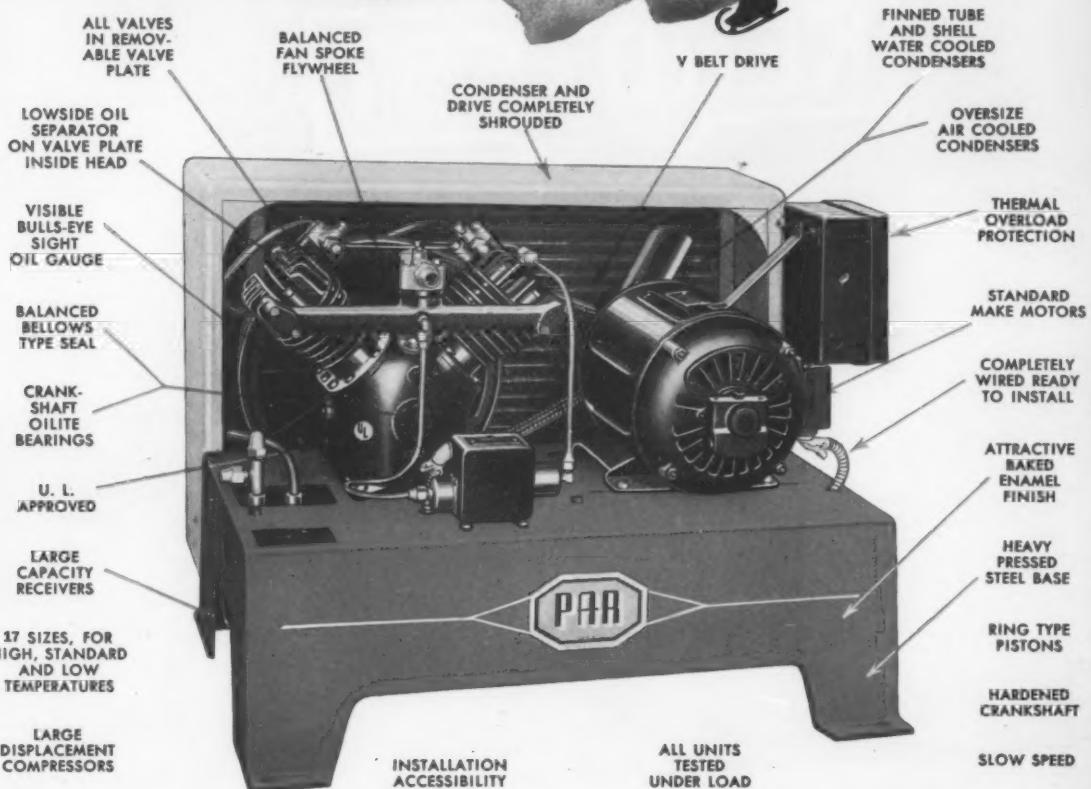


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THE WEATHERHEAD COMPANY, CLEVELAND 8, OHIO
Plants: Cleveland, Columbia City, Ind., Los Angeles
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Here are the
**24 OUTSTANDING
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*PAR—Condensing Unit Line sold exclusively
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PAR
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 DIVISION

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**Manufacturing Corporation, Defiance, Ohio
 U. S. A.**

keep your eye on



for Advanced
Precision Engineering
in Peacetime
AIR CONDITIONING
REFRIGERATION
VALVES
ACCESSORIES
FITTINGS



To simplify your peacetime Valve problems entrust your requirements to Kerotest engineers, now—you can be sure of reliable performance, durability and low maintenance in Valves that embody every new development in materials, designs and applications.

KEROTEST MANUFACTURING CO. PITTSBURGH, PA.



Valves... Accessories... Fittings...

THE *Refrigeration* INDUSTRY

VOLUME 2, No. 12

DECEMBER, 1945

The Refrigeration Industry

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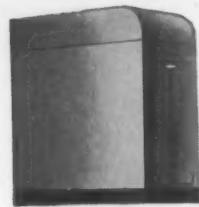
THE COVER . . . It's a cold-looking scene, and all the "rights" connected with it belong exclusively to Mother Nature, but we're "reversing the cycle" and using this space to thank all our friends and readers for their cooperation and encouragement during the year just ending, and to extend to you our most sincere wishes for a happy Holiday season.

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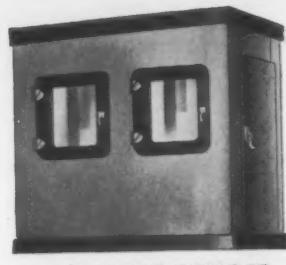
SPECIFY WHITE-RODGERS CONTROLS FOR



HEATING

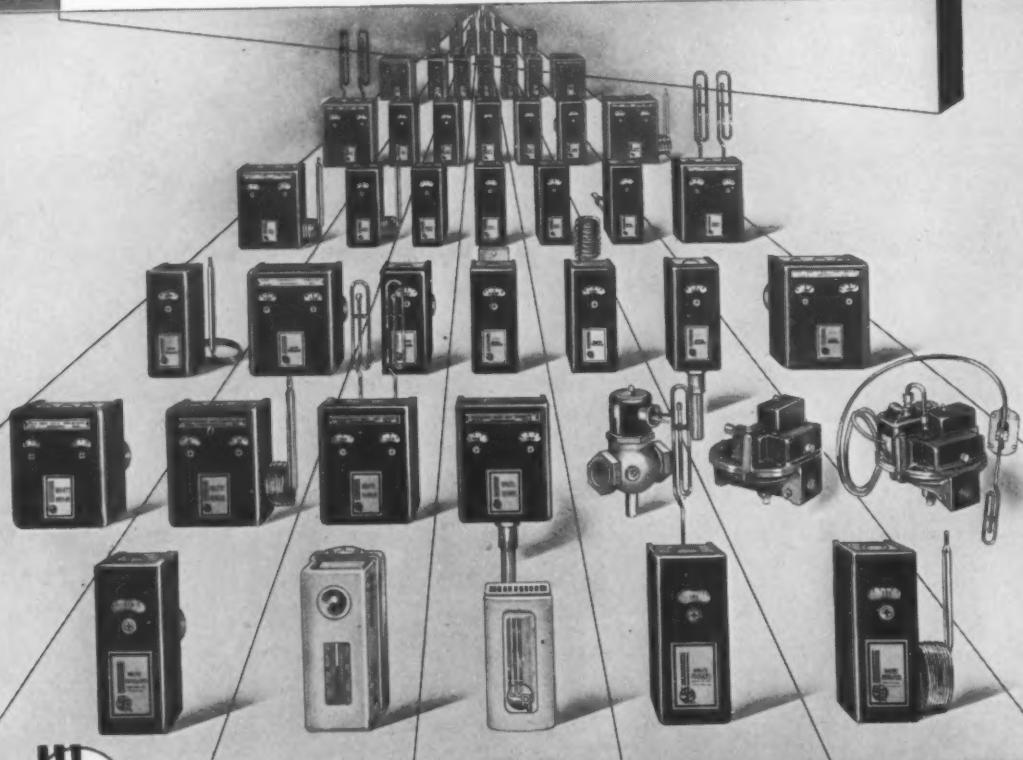


AIR-CONDITIONING



REFRIGERATION

Whatever the application, the complete line of White-Rodgers temperature and pressure controls will meet your need. Accurate, readily installed, compact and attractive; put these positive advantages of White-Rodgers controls to work for you. Write today for engineering data.



WHITE-RODGERS ELECTRIC CO.

ST. LOUIS 6, MISSOURI

Controls for Refrigeration • Heating • Air Conditioning



25 lb. pail illustrated.

The Ideal Dehydrant for Refrigerants

JAY CEE refrigeration gel is one of the most efficient dehydrating agents. It is especially prepared for dehydration of refrigerants, and may confidently be used for drying Freon, Methyl Chloride, Sulfur Dioxide or any other similar agent. Removes acids, prevents rust or corrosion and is not affected by oil. The special particle size retains its crystalline structure — assuring uniform distribution in the cartridge and complete contact with all pore surface areas.

We offer you this economical 25-lb. container with resealable Easy-Pour spout. Dehydrators can

easily be filled from this Easy-Pour container, and resealed to protect unused contents until needed. Special gasketed cover makes Easy-Pour container air-tight when not in use.

This highest quality product is also available in 1-pound, 5-pound, and 10-pound resealable metal containers, and in 100-pound bulk drums which can easily be sealed air-tight after use.

There are excellent opportunities for jobbers and distributors to develop profitable business on Jay Cee Silica Gel in a few territories. Write for details.

JOLIET CHEMICALS, LTD., INDUSTRY AVENUE, JOLIET, ILLINOIS



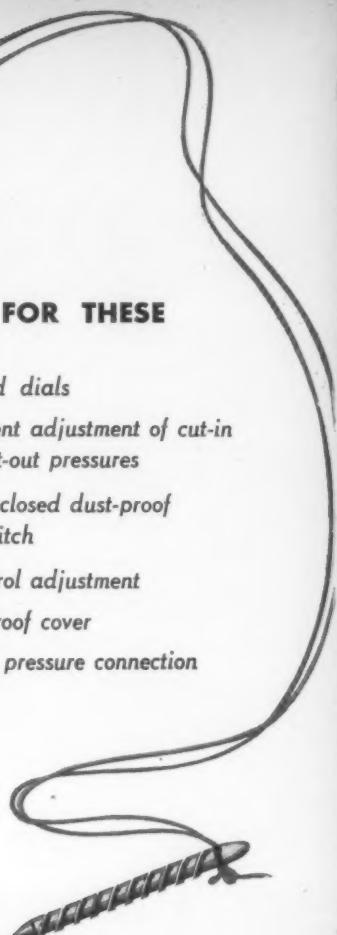
SILICA GEL

A superior dehydrant



LOOK FOR THESE

- Calibrated dials
- Independent adjustment of cut-in and cut-out pressures
- Totally enclosed dust-proof snapswitch
- Cold control adjustment
- Tamper-proof cover
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All these features are standard on Minneapolis-Honeywell Refrigeration temperature and pressure controls. Many others, especially designed to meet your individual requirements, are available. See your Honeywell branch or jobber for details. Minneapolis-Honeywell Regulator Company, 2909 Fourth Avenue South, Minneapolis 8, Minnesota.

MINNEAPOLIS
oneywell
CONTROL SYSTEMS

WE WERE ALMOST COMPLETELY DESTROYED BY FIRE ON SEPT. 14, 1945—

PAGE 48

THE CHICAGO SUN, SUNDAY, OCTOBER 7, 1945

Fire Didn't Stop This Factory's Job



It's No Circus Working Under a Tent

WHEN FIRE DAMAGED THE BUILDING housing Rotary Seal Co., at 2020 N. Larrabee st., about 10 days ago, officials erected a circus tent to cover their plant, continue vital work.

WORKMEN GO ABOUT THEIR DUTIES of turning out \$400,000 worth of back orders for Army, Navy and essential industry.

SUN PHOTOS



(At left) Reproduction of newspaper account of our fire which appeared in the Oct. 7th 1945 CHICAGO SUN.

Within a few days after fire wiped out nearly our entire plant we had the debris cleaned up, raw materials and supplies ordered, temporary power lines installed and a large circus tent erected to house our Assembly and Finishing Departments. Rebuilding was commenced and production gradually increased daily. When new equipment is installed normal output will be increased fifty per cent. Our production is being increased as rapidly as raw materials are received. We expect to be in normal production in the near future.

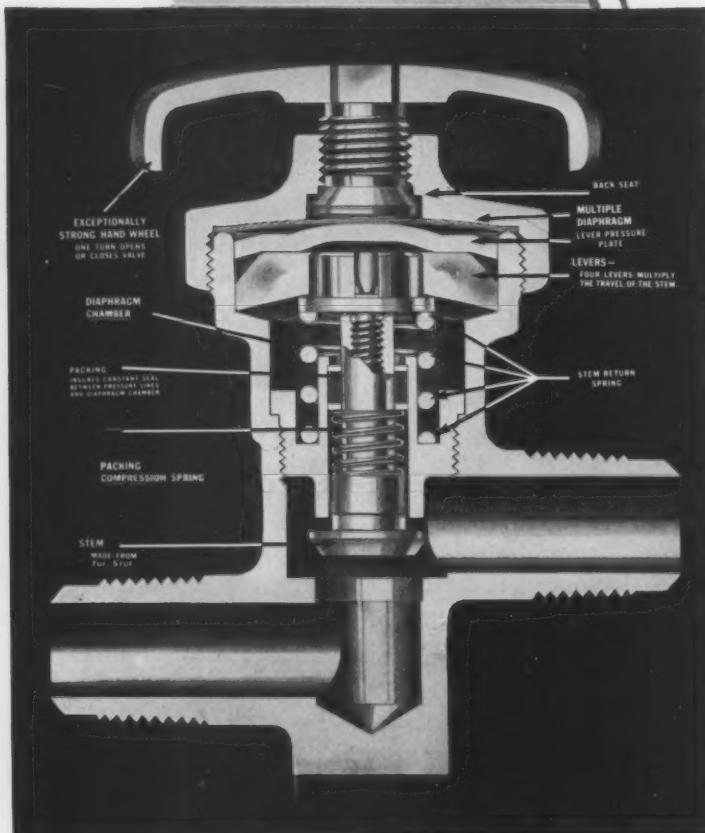


ROTARY SEAL COMPANY
2020 North Larrabee St.

DECEMBER, 1945

Increased...

DIAPHRAGM LIFE PROLONGS THE SERVICE LIFE OF THE VALVE



Because of the small amount of movement, the multiple diaphragm in our TRIPL-SEAL Valve is never deflected past its normal center; thus immeasurably prolonging both its life and the life of the valve in service.

The multiple diaphragm has approximately 20% increased surface area over more conventional types of diaphragms. A single turn only is necessary to open or close the TRIPL-SEAL Valve.

TRIPL-SEAL

Positive sealing at three essential points in the valve is adequately provided for—a back seat with valve in open position,—the multiple diaphragms,—and a packing around the stem. (This packing insures constant seal between pressure lines and diaphragm chamber.)

The stem of the TRIPL-SEAL Valve is provided with a sixty degree bevel, thus procuring the most desirable wedging action for positive and easy closing. It is manufactured from Tuf-Stuf, a strong, corrosion-resistant alloy.

The stem does not rotate, and is constantly guided into the same position against the seat by a cylindrical guide, so processed as to eliminate any possibility of distortion.

The body and cap of the valve are forged brass to eliminate seepage and to withstand frost action; mounting lugs are forged integrally with the body to provide the ultimate in mounting strength.

The hand-wheel is exceptionally strong, and is so designed that it provides a convenient grip for manual operation.

Valves are furnished in two-way, three-way, and angle type—flared or solder type ends—and in complete range of all necessary sizes.

Order through your jobber.

MUELLER BRASS CO.

PORT HURON, MICHIGAN

ORDER THROUGH YOUR JOBBER...ONE SOURCE OF SUPPLY...SAVES YOU TIME AND MONEY

You Can
Meet All Your
Requirements
With

the Complete Line of
CURTIS
Commercial Refrigeration and
Air-Conditioning Units

48 Water-Cooled Condensing Units — 1/3 to 30 H.P.

45 Air-Cooled Condensing Units — 1/4 to 3 H.P.

CURTIS offers both dealers and users a complete line of Commercial Refrigeration and Air-Conditioning Units in a wide range of types and sizes.

Curtis Air-Conditioners cool, dehumidify, filter, and circulate the air and are adaptable for heating, if desired. Available as packaged units, needing only power and water connections to install, or as central or remote types requiring ducts.

The result of Curtis' advanced engineering and 91 years of successful manufacturing experience is dependable, economical, trouble-free service throughout an exceptionally long life of heavy-duty service.

Other Curtis Products

- ★ Air Compressors (Industrial)
- ★ Air Compressors (Automotive)
- ★ Air Hoists
- ★ Air Cylinders
- ★ Car Washers
- ★ Automotive Lifts
- ★ Curtis Circular Saws



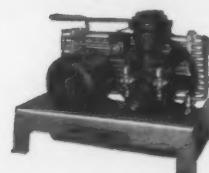
1/4 H.P. (cabinet type)



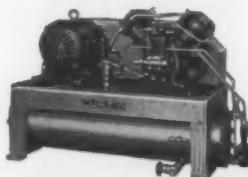
1 H.P. Air-Cooled



3 H.P. Air-Cooled



2 H.P. Water-Cooled (counterflow)



15 H.P. Water-Cooled Shell and Tube



Saturated Air-Condenser



Central Type Air-Conditioner



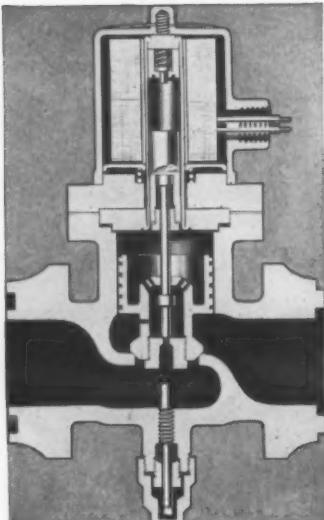
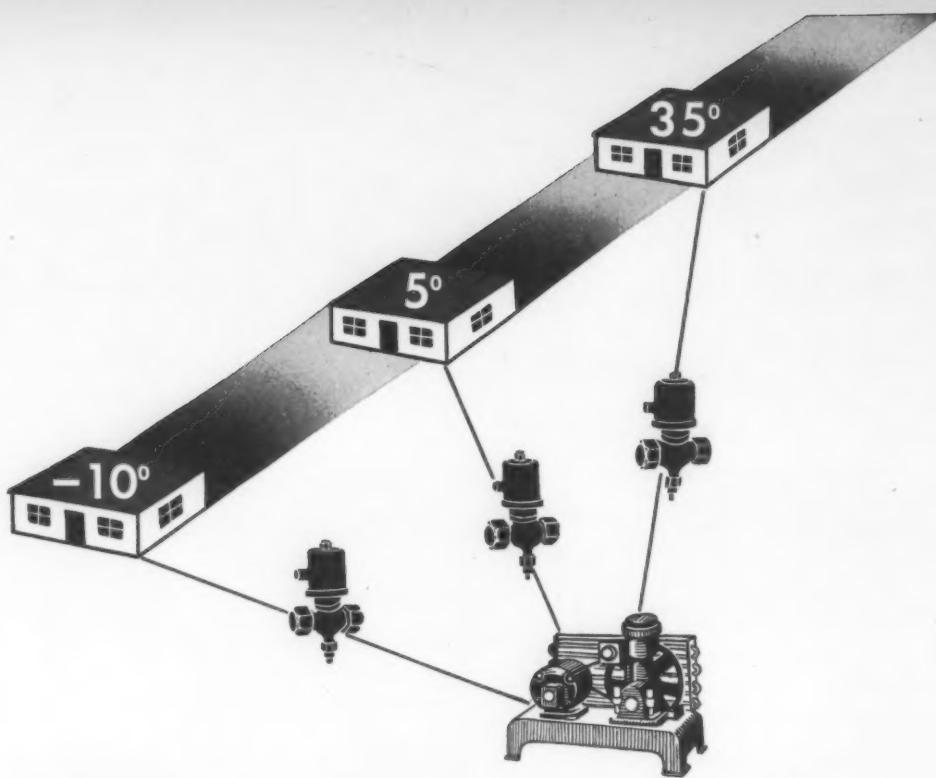
3 and 5-ton Packaged Air-Conditioner

AR-465

Curtis Refrigerating Machine Division
of Curtis Manufacturing Company

1915 Kienlen Avenue

St. Louis 20, Mo.



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MULTIPLE TEMPERATURE CONTROL
ALCO SOLENOID VALVES**

... Fully Automatic

When you want to keep two or more rooms at different temperatures, instant-acting Alco Solenoid Valves are the answer.

They control the refrigerant flow automatically with "pin point" accuracy and are electrically actuated by the temperature of the space to be cooled.

This is just one of the many applications to assure automatic positive flow control. For complete details, send for our Solenoid Bulletin.

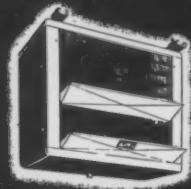


Designers and Manufacturers
of Thermostatic Expansion
Valves; Pressure Regulating
Valves; Solenoid Valves;
Float Valves; Float Switches.

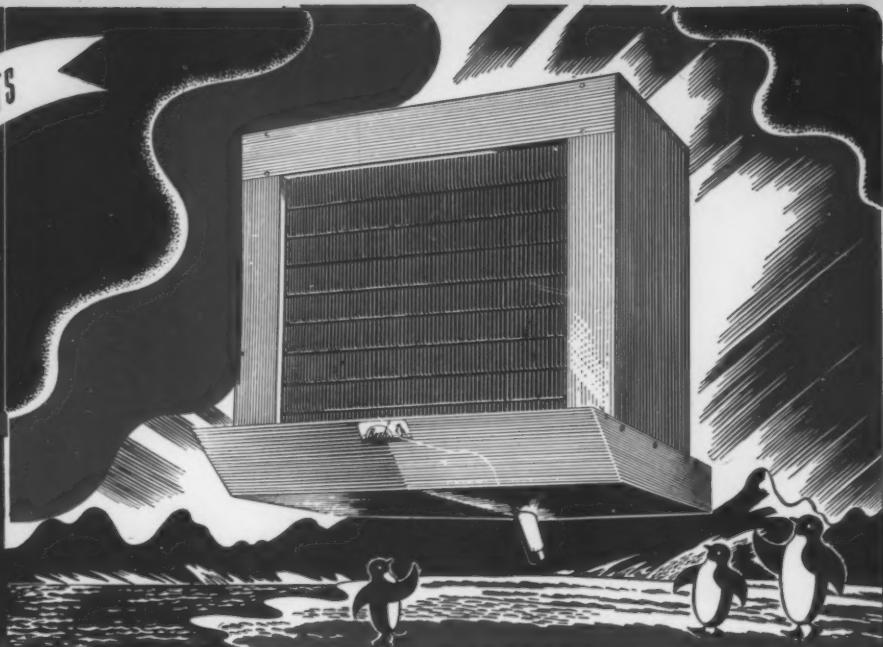
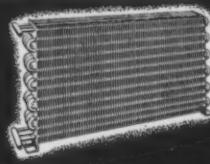
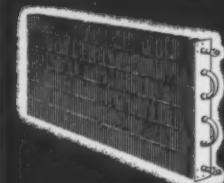
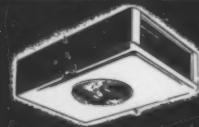
ALCO VALVE CO.

843 KINGSLAND AVE. • ST. LOUIS 5, MO.

BUSH PRODUCTS



ICE MAKING COOLS



Bush WATER DEFROST UNIT COOLERS

Bush Water Defrost Unit Coolers defrost in less than five minutes using ordinary tap water! A new method that completely defrosts, even at low temperatures. Cuts "warm-up" during defrosting to a minimum. Unexcelled for low temperature refrigeration below 32°. Five standard sizes for all applications.

Simple — fast — inexpensive. Defrosts in four quick steps: (1) Stop evaporator fan motor and compressor. (2) Open water valve for 1 to 1½ minutes. (3) Allow one minute for water to drain off. (4) Restart fan motor and compressor. Copper tube aluminum fin construction. Available with hot-dip galvanized steel cores for Ammonia and Brine.

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HARTFORD, CONNECTICUT 415 LEXINGTON AVENUE, NEW YORK • 549 W. WASHINGTON BOULEVARD, CHICAGO

EXPORT ADDRESS: 13 EAST 46TH STREET NEW YORK • CABLE "ARLAB"



★ Each dehydrant cartridge has a perforated dispersion tube which is connected to the inlet port. All of the dehydrant, therefore, is exposed to penetration without channelling. Minimum pressure drop.

★ Due to the strong dehydrant cartridge tube on the inlet fitting is provided. The refrigerant cannot bypass around the dehydrant cartridge.

★ Strains due to uneven or excessive bolt tightening are absorbed in recessed area (A) and cannot be transferred to flange gasket face (B). Outer flange rim lip (C) acts as "stop" to prevent excessive drawing up of bolts.

★ EXCLUSIVE PATENTED FEATURES

CONVENIENCE AND EFFICIENCY RECOMMEND THIS HENRY CARTRIDGE DEHYDRATOR

EVERY trace of moisture can be removed from a Freon or Methyl Chloride refrigeration system and it can be kept moisture-free *conveniently* with this Henry Cartridge Dehydrator. The side outlet permits permanent installation of the dehydrator in a line. The flange shell construction affords easy replacement of cartridge. On new installations the dehydrant cartridge can be inserted AFTER the system has been pressure tested for leaks. Henry design, however, provides more than just operating conveniences—it *assures greater operating efficiency* because of the patented dispersion tube, dehydrant compression spring and distortion-proof flange, illustrated and described above. Available in a wide range of sizes with refill cartridges—with either Activated Alumina or Silica Gel. Cartridges are packed in moisture-proof containers.

*Ask Your Jobber For A Henry Type 756 or 757 Cartridge Dehydrator—
He Has It Or Can Get It For You.*

HENRY VALVE COMPANY

3260 WEST GRAND AVENUE, CHICAGO 51, ILLINOIS

PACKLESS AND PACKED VALVES • STRAINERS • DRYERS FOR REFRIGERATION AND AIR CONDITIONING
AMMONIA VALVES • FORGED STEEL VALVES AND FITTINGS FOR OIL, STEAM AND OTHER FLUIDS

Ever See a *Conscience* being Assembled?

ONE OF THE REASONS 6 OUT OF 10 PICK U. S. GAUGES



WHY A GAUGE DOES RIGHT BY YOU

What you prize most in a gauge is accuracy. U. S. Gauges, like all self respecting U. S. instruments, "tell the truth." One reason: they have a marvelous mechanical "conscience," a movement you can count on,

made to tolerances as low as .0005", even when gang assembled!

All U. S. gauge movements are built wholly within the shop of U. S. Gauge.

WHY 6 OUT OF 10 CHOOSE U. S. GAUGE

The assembly of a gauge movement wedges a number of small, precisely made parts . . . but it's only one step in U. S. gauge-making. Secret of the preference for U. S. Gauges is the application of *Manufacturing Control* to all steps . . . from raw material to production, assembly, calibration, testing, inspection. Over 6 out of 10 original equipment buyers choose U. S. G.



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PRODUCTION of excellent gauge movements in tremendous quantities is a triumph of U. S. G.'s *Manufacturing Control*.

UNITED STATES GAUGE

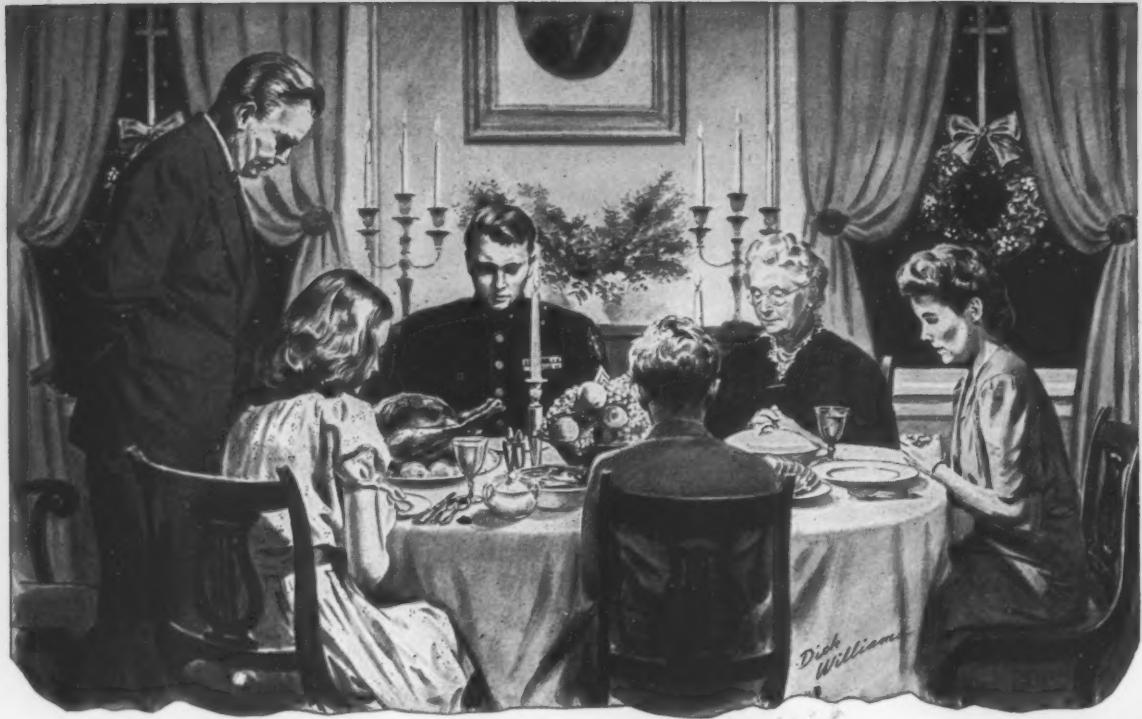
DIVISION OF AMERICAN MACHINE AND METALS, INC.

SELLERSVILLE, PA.

Manufacturers of Pressure, Temperature, Flow, and Electrical Measuring Instruments

U. S. INSTRUMENTS Tell The Truth





What's the other thing we ought to do this Christmas?

FOR the last four years, the Christmas phrase "Peace on earth, good will to man" has had a pretty hollow, bitter ring.

This year, it won't.

And surely, one thing each of us will want to do this Christmas is to give thanks that peace has finally come to us—both peace and victory.

One other thing we ought to do:

In our giving, this year, let's choose first—the kind of gift that helped to bring us peace and victory and will now help us to enjoy them.

*

Victory Bonds take care of the men who fought for us—provide money to heal them, to give them a fresh start in the country they saved.

Victory Bonds help to insure a

sound, prosperous country for us all to live and work in.

Victory Bonds mean protection in emergencies — and extra cash for things we want to do ten years from now.

*

Choose—first—the finest gift in all the world, this Christmas.

Give Victory Bonds!

Give the finest gift of all — VICTORY BONDS!

THE REFRIGERATION INDUSTRY

★ This is an official U. S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council ★

KRAMER *Radial* UNIT COOLER



1. SAVES SPACE.

Installed in mid-ceiling—occupies a minimum of overhead space.

2. EFFECTIVE AIR DISTRIBUTION.

Even discharge in all directions assures uniform temperature throughout the refrigerator.

3. CORRECTLY ENGINEERED.

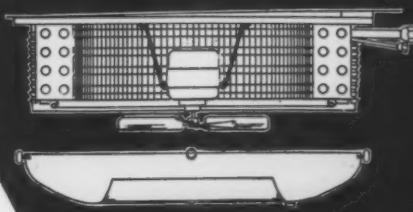
Low discharge velocity.
High relative humidity.

4. TOPS IN CONSTRUCTION.

All copper coil.
Ball-bearing motor, totally enclosed.
REQUIRES NO OILING.
Built-in Heat Exchanger.
Silent fan.
Bottom pan easily removable for free access to all parts.

5. ATTRACTIVE.

Two-tone crackle finish.
Specially designed Venetian discharge Grille.



SEND FOR
CATALOG R-142 **R1**

KRAMER TRENTON CO.

Trenton, New Jersey

"Come and Get It!"

ICE CUBE MAKER

ICE CUBE MAKER

FIN COIL

FLASH COOLER

OFF-CENTER COIL

PEERLESS OF AMERICA, INC.
EXECUTIVE and GENERAL SALES OFFICES
333 N. MICHIGAN AVENUE, CHICAGO 1, ILLINOIS, U.S.A.

Thanks to speedy reconversion, PEERLESS OF AMERICA, Inc., can now say: "Come and Get It!" We're ready for your orders for immediate shipment on many PEERLESS products, the products of known leadership your customers are waiting for. Shown here are the PEERLESS Flash Cooler, Ice Cube Makers, Fin Coil, and Off-Center Coil. Also in production are PEERLESS Capacity Boosters and Expansion Valves. They're all rolling off the lines. Come and get 'em!

Sold through leading refrigeration supply jobbers.



You could call it a "Moisture Eradicator"

HERE you see one of the installations in which Revere Dryseal Copper Tube is dried and sealed—in order to make it perfect for refrigeration, air conditioning, heat control, bottled gas and other exacting services.

This tube is available now. It comes in coils of 25, 50, and 100 feet, and each length is individually treated to remove all interior moisture, then sealed at both ends. You get it clean, bright, and bone dry, so that no moisture is present to react with any refrigerants and produce corrosive products.

This is but one of the "kid glove" treatments given Revere Dryseal Copper Tube so that it will serve you better. It is made of deoxidized copper, and is carefully kept free of oxides during every manufacturing step. In annealing this tube to dead softness, for example, the heating is done in a controlled atmosphere.

It comes in sizes from $\frac{1}{8}$ " to $\frac{3}{4}$ " O.D., with .035" wall. Also available for refrigeration, air conditioning and a variety of other services is Revere Sealed End Copper Tube, which has each end plugged and taped for protection against injury and contamination. Both Revere Dryseal and Revere Sealed End Copper Tube are available from Revere Distributors in all parts of the country. The Revere Technical Advisory Service is always available to help you.

REVERE
COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices: 230 Park Ave., New York 17, N. Y.
Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.;
Rome, N. Y. — Sales Offices in principal cities.

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"DETROIT" Automatic EXPANSION VALVES

For long life and highest satisfaction in operation

No. 672 "Detroit" Automatic Expansion Valve.



No. 672 Automatic Expansion Valve

No. 672 "Detroit" Automatic Expansion Valve's high quality makes it ideal for original equipment and replacement service.

Only one moving part—adjustment is easy; valve seat wear is minimized; large orifice is easily removed. Special bellows resists corrosion, ensuring long life.

Available either with rubber breather cap or knurled metal cap. Pressure ranges 25 psi vacuum to 25 psi maximum. Inlet sizes: 1/4", 3/8", 1/2", 5/8", 3/4", 7/8", or 1 1/2". Outlet sizes: 1/4" or 3/8" O.D. tubing. Capacity—33 to 2.6 tons Freon; 46 to 6.6 tons Methyl Chloride.

No. 892 "Dura-Fram" Automatic Expansion Valve.

No. 892 and 895 Automatic Expansion Valves

Special brass body ensures long life, freedom from corrosion. Silver brass joints prevent refrigerant leak. Blockage of operating alloy is easily removable in service. Handles and seats are of Duraloy—hard, corrosion resistant.

May be located at any point—even in the refrigerated compartment without affecting their operation.

No. 892 has a range of 15° vacuum to 40 psi maximum. Inlet sizes: 1/4" or 3/8" SAE (for 3/8" or 1/4" reducing flare out). Outlet 1/4" female NPT, 3/8" or 1/2" SAE. Capacity—1/2" ton Freon; 1 ton Methyl Chloride.

No. 895 has a range of 15° vacuum to 40 pounds maximum. Inlet sizes: 1/4", 3/8", 1/2", 5/8", 3/4", 7/8", or 1 1/2" female NPT, 3/8" or 1/2" SAE. Capacity—1 ton Freon; 2 tons Methyl Chloride.

No. 892 "Dura-Fram" Automatic Expansion Valve.



General Offices: 5800 TRUMBULL AVENUE, DETROIT 8, MICHIGAN

Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

DRYING AUTOMATIC EXPANSION VALVES

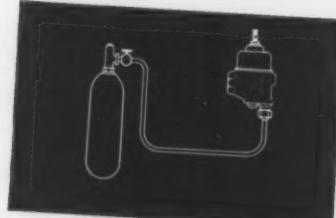
No. 7 of a Series

Moisture in a refrigeration system may so permeate the valves that they may need to be dried separately.

Detailed here are four effective methods of drying "Detroit" Automatic Expansion Valves—No. 672, 892 and 895.

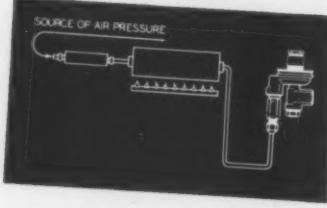
When a No. 672 valve is heated it must be kept in an upright position so the dampening fluid inside the bellows shell will not escape. On No. 672 valves having a range of 0 to 50 psi, loosen adjusting screw completely. On No. 672 valves having a range of 25° vacuum to 25 psi, set adjusting screw at midpoint. Always remove the adjusting screw cap or rubber breather cap before dehydrating.

No. 892 and 895 valves may be dehydrated in any position. Remove adjusting screw cap and rubber gasket, and loosen adjusting spring completely before dehydrating.

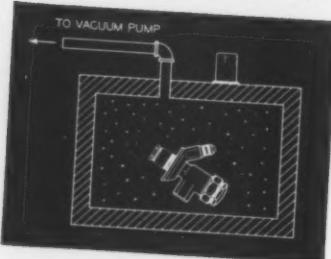


Method No. 2 Atmospheric Oven (4 hours)
Use any type oven, but temperature regulation is absolutely essential to avoid damaging the valve.

Dehydrate 4 hours at temperature of 220° F maximum. Install or cap as soon as valve has cooled to avoid entry of moisture from air. No. 672 Valve must be kept in an upright position.



Method No. 3 Hot Dry Air (30 minutes)
Connect inlet of valve to source of hot dry air, under pressure (see sketch). Blow hot air (220° F maximum) thru valve for 30 minutes. Cap or install valve at once.



Method No. 4 Heat and Vacuum Oven (3 hours)
Required is a temperature regulated vacuum oven and a vacuum pump capable of drawing a vacuum of 26" or 27" mercury minimum.

Place valve in oven, heat to 160° F maximum (No. 672 upright); hold under heat and vacuum for at least 3 hours. Cap or install valve at once.

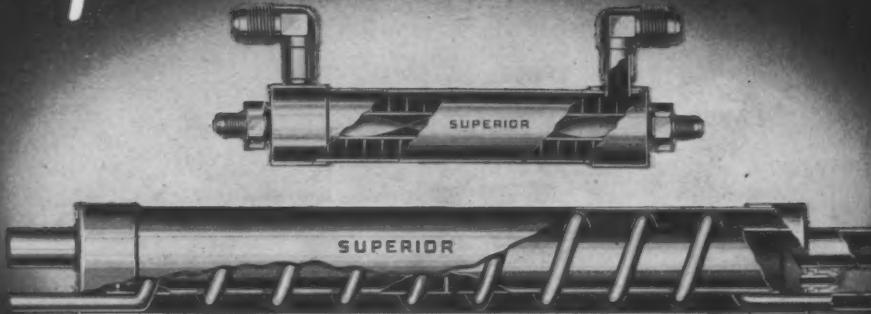
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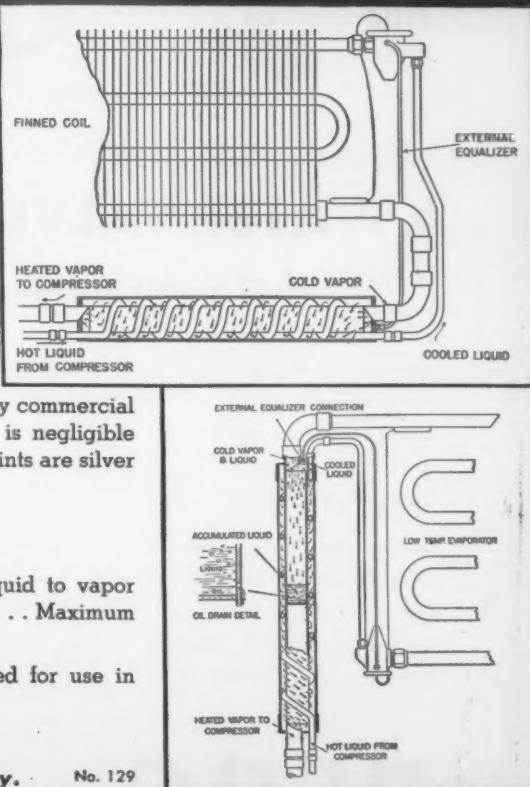
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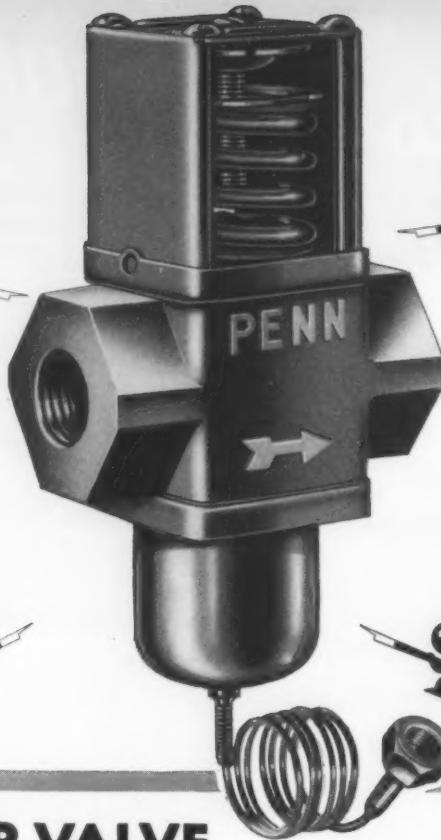
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BTU'S

News • Laws • Trends

New Baker Ownership. Arrangements have been completed under which two companies in the Equity Group of investment companies have purchased, for an undisclosed amount, control of Baker Ice Machine Co., Inc., Omaha, Neb., and its subsidiary, Northwest Baker Ice Machine Co., Seattle, from the Baker family and associated interests.

The announcement was made by R. L. Baker, president. Mr. Baker, his brother, C. A. Baker of Glen Ridge, N. J., and their brother-in-law, H. G. Kelly, also of Omaha, are retiring as active managers of the company. Its name and present personnel are expected to be retained by the new owners, who are planning to supply new management and strengthen the company further with ample financing for expansion, research and sales promotion.

Rotary Reconstructing. Reconstruction activities are in full swing at Rotary Seal Co., following the recent \$100,000 fire there, vice president Charles Muller reports. Rotary's machine shop is in full operation, Mr. Muller says, and the finishing and assembling departments are operating under a circus tent while reconstruction of the damaged building is progressing. When the full rebuilding program is completed, according to Mr. Muller, the company's production will be increased 50% over normal production. Negotiations for additional machinery and equipment are now under way.

"Reconversion" Price Ceilings. Ceiling prices for new household refrigerators have been set in a new regulation (MPR 598) issued Oct. 22 by the Office of Price Administration. The regulation governs prices of "reconversion" models—those manufactured after July 1, 1945. Ceiling prices under the regulation were established as follows:

Manufacturers: ceiling prices in effect on March 30, 1942, for the same or closely similar models, if these are higher than prices as computed under the individual reconversion re-pricing formula included in the regulation. Otherwise each firm is eligible for an individual adjustment over its October, 1941 prices to reflect legal increases in materials prices and basic wage rate schedules for factory workers. Allowance for profit will be either its own 1936-39 average or half the industry average, which ever is greater.

Distributors: margins will be cut slightly over one percentage point as compared with "initial margins"—those included in the original asking price—on record in March, 1942, but should yield at least as high as those realized in 1941, OPA said.

Retailers: dollar-and-cent prices listed in the regulation or to be added later. These allow a margin in each case less than recorded 1941 initial margins by slightly over one percentage point, OPA said. Here also, it was explained, there will be no actual reduction, dollar- or percentage-wise, in 1941 realized margins, since dealers will not find it necessary to accept trade-ins at above their re-sale value, or to hold special sales to stimulate consumer buying.

Stores Add Cooling. The nation's department stores, set to spend \$60,000,000 for new air conditioning equipment, are losing no time in getting that phase of their projected billion dollar modernization program under way.

Throughout the country, department stores report rapid progress in plans for air conditioning installations and at least one big store—Mandel's in Chicago—already has put in operation a new 800-ton compressor unit to service four floors of a 16-story building.

The Mandel's installation takes the place of a 300-ton unit used during the war by the WPB in a synthetic rubber plant in the South.

Peerless to Decentralize. As the first move in a post-war policy to separate its manufacturing operations into specialized manufacturing types, R. W. Kritzer, president of Peerless of America, has announced the sale of the company's plant in Marion, Ind. Under the company's new policy, mass production items for sale in the refrigeration and air conditioning field will be separated completely from custom-built equipment. Mass production machinery now being designed and process lines being worked out for such items will be installed in separate factories located in the close-in area of the Chicago manufacturing district.

The move is being made during this reconversion period, Mr. Kritzer said, so it will have least effect upon the company's deliveries; machinery and equipment for new products will be shipped and installed direct in Chicago units rather than in Peerless' former factory. Better deliveries, better merchandise, and better prices are expected to be effected by the decentralization and specialization move.

Executive and general sales offices of the company will continue to be at 333 N. Michigan Ave., Chicago, and all orders and correspondence will be handled from these offices.

Locker Industry Ties-In. The locker plant industry convention and show will tie in with the All-Industry Refrigeration and Air Conditioning Exhibition, which has been set for the Cleveland Public Auditorium during the last week in October, 1946. This decision was made following a joint meeting of officers of Refrigeration Equipment Manufacturers Association, sponsor of the

Continued on page 54



Shelves, racks and boxes for the cold storage plant were built of oak, placed on wheels for easy movement. In rack at left are oven-ready meats.

REFRIGERATION

IN OAK RIDGE, city of the atomic bomb, located near Knoxville, Tenn., a cold storage plant operated by a wholly-owned subsidiary of Turner Construction Co. of New York receives about 1,200,000 pounds of perishable merchandise a month. The amount issued in the same period ranges from 880,000 to 1,000,000 pounds, since the plant tries to retain from three to four months supply in stock. About 75 per cent of the food handled is meat.

Under government supervision, the Roane-Anderson Co. has operated many facilities for the Clinton Engineer Works, the 59,000-acre government reservation which includes atomic bomb production plants and Oak Ridge, the residential area of 75,000 persons. In addition to the cold storage plant, Roane-Anderson has managed dormitories, cafeterias and housing. It operates a railroad, maintains roads and streets, and is in charge of utilities such as electricity, water and a central heating plant.

In April, 1944, the Turner subsidiary started operation of the cold storage plant. It stored food for the eating facilities which, at one time, included nine cafeterias, two snack bars and table service dining room. In these units, an average of 1,200,000 meals were served each month. The cold storage plant also served five school cafeterias and three nursery schools, as well as various concessionaires and retail stores. It stored serum and blood plasma for the Oak Ridge hospital.

The plant was placed under the supervision of Walter W. Ochsner, superintendent of Roane-Anderson's supplies warehouses. As head of the warehouses, he has handled a large percentage of the supplies for the Oak Ridge area, such as staple food items, house and office furniture, cleaning, laundry and dormitory supplies, and most hospital supplies with the exception of medicines.

The cold storage plant had been erected by the government, and

though refrigerating machinery had been installed, it lacked the shelves, boxes and racks necessary for operation. Since delivery on standard fitting-out equipment could not be obtained inside of nine months, it was decided to construct it out of oak in



Walter W. Ochsner, superintendent of the supplies warehouse, is the man in charge of the Oak Ridge storage plant.

the Roane-Anderson carpenter shop.

In design, the shelves, racks and boxes are similar to the usual cold storage equipment—with one important difference. It was built on wheels, so that it could easily be moved out of the storage rooms and washed frequently. A lattice-like construction was used in order to allow the air to circulate freely. Mr. Ochsner has found this equipment very satisfactory. The president of one of the national refrigeration companies said it was the best substitute equipment he had ever seen.

The population of Oak Ridge increased so rapidly that before the cold storage plant could be put into operation, the demand for storage space was three times its capacity. Through the Army, Roane-Anderson obtained a knock-down plant which had been designed for use overseas. It was fully equipped and came in sections on the railroad, ready to be assembled. The knock-down plant was set up adjacent to the original plant on a permanent concrete flooring.

Capacity of the entire plant is now



A central butcher shop, located in the Oak Ridge cold storage plant, cuts carcass beef into oven-ready and ready-to-serve cuts. Most of this is supplied to the many cafeterias and restaurants on the atom bomb site.

chinery is serviced by the East Tennessee York Refrigeration Co., which maintains an office within the government reservation, and is on call day

for delivery, since distances of as much as 14 miles are frequently involved.

When Roane-Anderson first began management of the cafeterias, each one employed its own butchers. In order to make this activity more economical, a central butcher shop was started in the cold storage plant. Here, carcass beef is made into oven-ready and ready-to-serve cuts. Though the cafeterias are no longer operated by Roane-Anderson, the butcher shop in the cold storage plant still supplies meats to cafeterias and restaurants in Oak Ridge.

During the height of the meat shortage, the company tried to prevent the drain of meat stocks into Oak Ridge from the surrounding Tennessee area. A herd of cattle, kept within the government reservation, supplied a great part of the meat consumed in Oak Ridge. Personnel for slaughtering was difficult to obtain

Continued on page 57

11,086 square feet and has cold rooms of 0, 10, 32-35, 40 and 50° F. temperature. The plant is operating at capacity, and has a rapid turnover. It uses Freon refrigerant and water-cooled condensers. An ammonia plant is now being installed. Refrigerating ma-

and night.

Rental is computed on the basis of the weight of the merchandise stored, and prices are based on those charged in Knoxville. Billing is done direct by the plant's accounting department. A refrigerator truck is maintained



During the meat shortage, a herd of cattle pastured within the area supplied much of the requirement. Carcass beef is here delivered at the plant.

SO YOU THINK YOU HAD TO IMPROVISE!



Putting Manila's first post-liberation refrigeration plant back in operation was a job that called for plenty of know-how. Here's the story of the job and of the man who saw it through to the end



Front of the San Miguel Ice and Storage plant (above) after the Japs had finished their work on it. Below is a view of the rear of the same building.

HERE'S the story of the first major industry—refrigeration—to be put back into service in Manila, Philippine Islands, after the liberation of that city from the Japs. It's also the story of the American refrigeration man whose "ingenuity, interest and determination" in achieving this result in the face of overwhelming difficulties won for him a citation for meritorious achievement "reflecting great credit upon himself and upon the military service."

He is Maj. Ernest A. Firebaugh, Corps of Engineers, U. S. Army. Before he went into the Army, "Ernie" Firebaugh, as his friends know him, had been branch manager for Super-Cold Corp. in Cleveland, sales manager for the company in five southwestern states, and had operated his own general refrigeration business in Houston, Tex.

In the Army, he was in charge of

refrigeration in the South Pacific for a year and a half, handled refrigeration procurement for the Army in Australia, directing among other things the construction of 25 ammonia refrigeration barges and 12 Freon barges at Brisbane.

"For meritorious achievement in rehabilitation of San Miguel Ice and Storage Plant at Manila, Philippines, from 22 February 1945 to 15 March, 1945", his citation reads. "As an engineer officer in charge with rehabilitating this installation, he worked diligently and tirelessly and through his ingenuity, interest and determination, coupled with his uncanny ability to improvise; he had 80,000 cubic feet of refrigerated

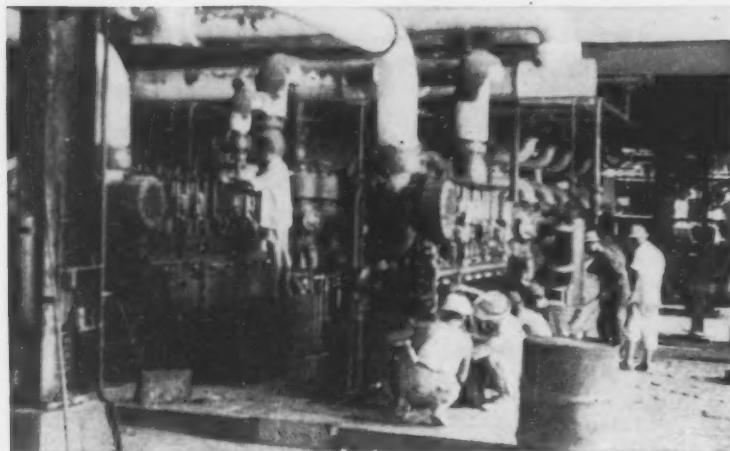
space in operation within 21 days. This outstanding accomplishment proved to be a valuable asset to base operations in that it provided refrigerated storage space for vitally needed medical supplies, such as



Here's Maj. Ernest A. Firebaugh, the U. S. Army engineer who directed the reconstruction job described here.



At left, above and below, are two views of the interior of the San Miguel plant which reconstruction of refrigeration equipment was in progress. The refrigeration machines are of Swiss manufacture.



blood plasma, fresh blood, and penicillin. These supplies were particularly vital at a time when the combat phase of military operations was still in progress in Manila and when no other source of refrigeration or ice-making facilities were provided."

What follows is the story of how the rebuilding job was accomplished.

Maj. Firebaugh was called to Manila a few days after the liberation of that city. Reporting to the engineer in charge of the district, he was instructed to find refrigeration and ice-making facilities. All plants in the city had been destroyed either by the Japanese or by American shelling.

Looking over the plants, Maj. Firebaugh selected the San Miguel Ice and Storage Plant as the one which could best be rebuilt. His first step

was to contact San Miguel officials, who promised to locate all former employees still in the area. He next hired 250 Filipinos to act as mechanics, welders, and electricians. One of his most valued assistants was Santiago Elizaga, a graduate of Purdue University in both electrical and me-

chanical engineering, who had been with the ice company as chief electrical engineer. Maj. Firebaugh made him his No. 1 man on the job. Then he had two of his former assistants, Sgt. Floyd Pittard, of Aurora, Ill., and M/Sgt. Tom Price, of Boston, flown up from New Caledonia and Leyte, and they all went to work.

The first job was to clean up the plant so that reconstruction could be started. The entire building had been barricaded, and parts of it had been blown up and set fire to, to prevent the Japs using it. Most of the storage rooms were wrecked. Out of the original 200,000 cu. ft. in the plant, only about 80,000 cu. ft. was useable. All lines had to be re-gasketed, the lead gaskets having been melted out, and the old framework of the building had to be torn down. The cooling tower, which had been destroyed, was replaced with an atmospheric type unit.

In the main engine room there were four 165-ton, two-stage Sulzer (Swiss) compressors. These were direct-connected to a six-cylinder, 450 H.P. Diesel engine, also of Sulzer make. By ingeniously switching materials from one unit to another, the men were able to rebuild two of the compressors and get them into operation on the twenty-first day after they had started.

A major problem was finding parts and materials to work with, since the crew had virtually none of its own. Figuring that the end justified the

Continued on page 43



This is a view of one of the portable warehouses whose construction Maj. Firebaugh supervised in New Caledonia.

Sub-cooling

By A. D. Sullivan

Application Engineer Brunner Mfg. Co.

THIS review of the uses of the sub-cooling principle may be a help to practicing refrigeration men. The first, though less well known, of these uses concerns the determination of refrigerant charge.

Refrigeration service engineers are familiar with one or several ways of checking for refrigerant shortage. On small systems it is generally possible to open a flare connection in the liquid line. A spray of liquid indi-

Want to increase the capacity of a refrigerating system? Check refrigerant charge? Up condenser capacity? A knowledge of sub-cooling will make all these tasks easier for you

cates a sufficient, or nearly sufficient, charge. When the liquid line cannot be opened, as in an hermetic unit, experienced men can explore the condenser and judge from the gradations of temperature if refrigerant is needed. Also, many service manuals state that a "warm" liquid indicates

a shortage.

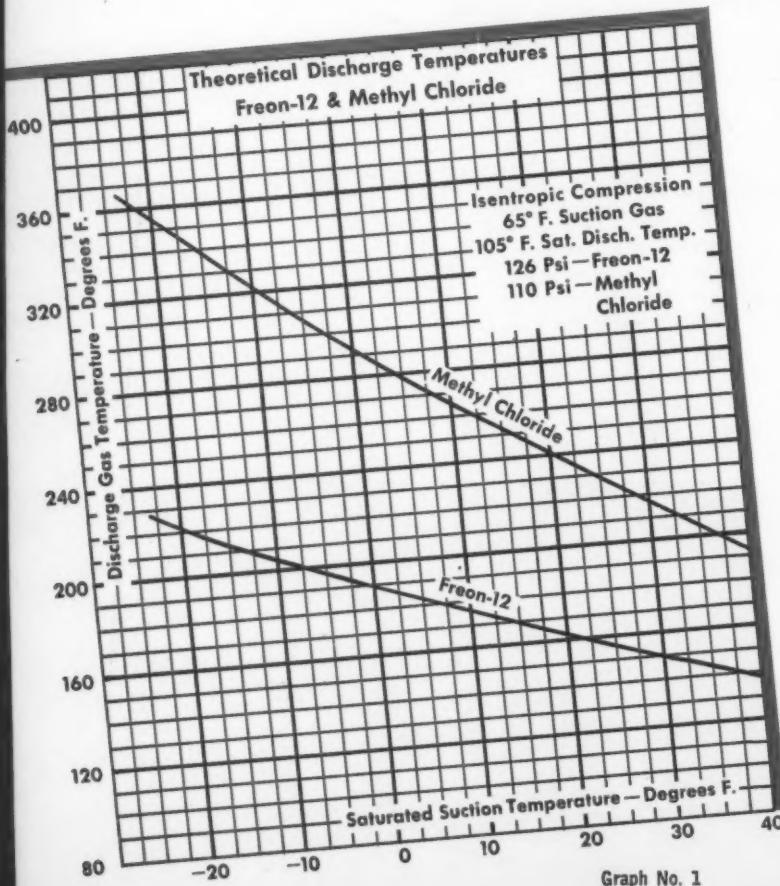
These methods have serious objections. Liquid will spray from a "cracked" liquid connection, even with a mixture of gas and liquid flowing. Warm liquid lines do not necessarily mean a shortage, nor does a cool line indicate a sufficiency of refrigerant, since liquid temperature is dependent on condensing temperature, and hence head pressure.

Manufacturers of condensing units urge service engineers to make a liquid line sight-glass or bull's-eye standard installation equipment. On some water-cooled condenser shells there is a provision for determining liquid level consisting of a screw plug in the condenser shell at the point of minimum liquid level. A spray of refrigerant past the loosened plug indicates a full liquid line.

Detecting Shortage

However, a very satisfactory way of detecting refrigerant shortage (or sometimes more important, refrigerant excess) is by the degree of liquid subcooling. By this is meant the difference between the saturated temperature corresponding to the discharge pressure, and the temperature of the liquid leaving the condenser or receiver. For example, a container of Freon-12 at a temperature of 105° F. exerts a pressure of 126.2 p.s.i. on the walls of the container. Now, if this container is the condenser of an operating refrigerating system and the exit liquid is at a temperature of 100°, there is said to be 5° of liquid subcooling. Incidentally, this is about the minimum for smooth operation of most expansion valves.

To check on the degree of subcooling, the service engineer needs a fair-



A USEFUL TOOL

ly accurate gauge, to read discharge pressure, and an ordinary thermometer. The thermometer is taped to the liquid line near the condenser, or inserted in a well clipped around the line. A half-inch thickness of hair felt, wrapped around the bulb and line, is recommended. Condensing temperatures are usually not so much above room temperatures that a serious error results from taking the temperature of the line as the temperature of the liquid within. The correction for this factor is only about 1° for a 40° difference between room and apparent pipe temperature.

Liquid Line Temperature

If there is no liquid in the condenser and therefore gas in the liquid line, the liquid line temperature will be above that corresponding to the saturated discharge temperature. If our F-12 condensing unit with the 126 p.s.i. discharge pressure is part of a system with a suction pressure of 37 p.s.i. and suction gas temperature of 65° F., the gas enters the condenser at about 152° F. If no liquefaction takes place, the process in the condenser is merely a cooling of the superheated discharge gas, and the liquid line must be at some temperature between 152° and 105°, the saturated temperature for 126.2 p.s.i. (See Graph No. 1.)

The fallacy of the "warm" liquid line symptom is at once apparent when one considers the number of installations which operate at 80° (or less) condensing, particularly the lower temperature jobs where the lessened pressure ratio improves volumetric efficiency. The liquid line on such a system could feel cool, even though a shortage existed. The reverse is also true. Air-cooled units in Army tanks were expected to operate at 140° to 150° condensing, obviously resulting in a quite warm liquid line.

There is another argument in favor of knowing the liquid temperature.

An overcharged system is revealed by 10 to 15° or more difference between saturated discharge and liquid temperatures. In a water-cooled unit, this indicates that the lower row or rows of tubes are covered with liquid and, therefore, not available for condensing the discharge gas.

The result is higher head pressures and a decrease in compressor efficiency, if the condensing unit is operating at its maximum design capacity. It is quite true that subcooling the liquid increases the heat-removing ability of the refrigerant, and thus

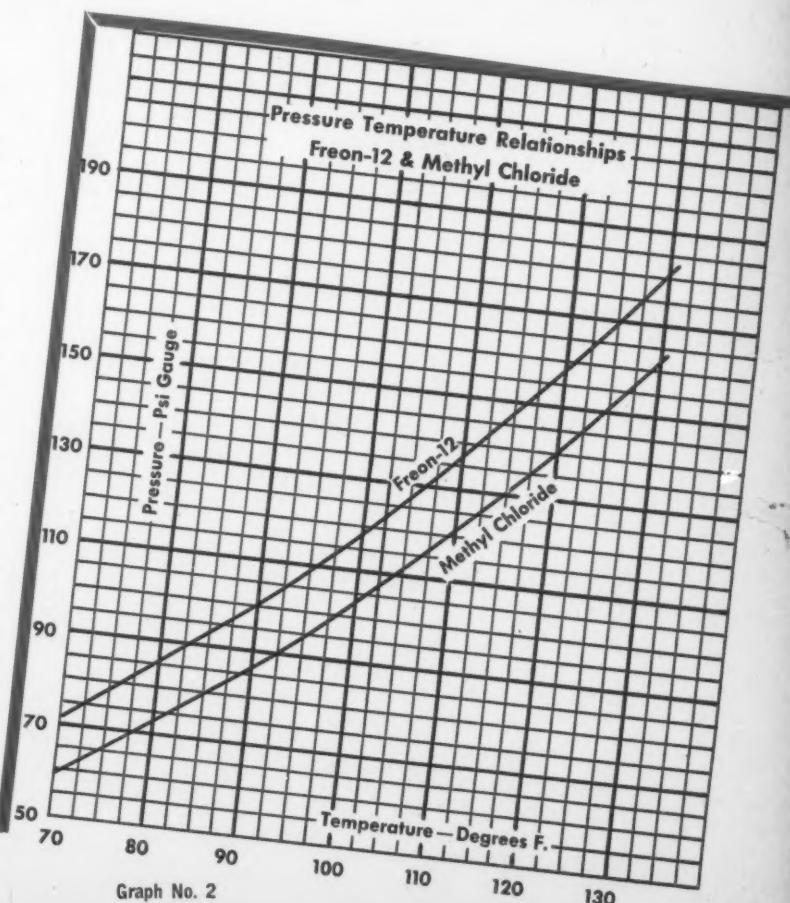
the "capacity," of the compressor, but this is making poor use of condenser surface.

Several complaints of faulty condenser operation and high head pressures have been traced to refrigerant overcharges. Manufacturers customarily build into condensers 150% of the compressor rated capacity, anticipating fouling and lowered heat transfer ability due to water impurities in some sections of the country. This factor of safety is none too great in certain localities, and the situation is obviously aggravated if 10 to 20% of the condenser surface is liquid covered due to the zealous efforts of perplexed service engineers.

Long Vertical Lines

Assurance of solid liquid for the valve at the top of long vertical lines can be gained from a knowledge of the subcooling at the condenser exit. Suppose that our hypothetical unit

Continued on page 46



THE B WHEN WHERE WHY HOW OF EVAPORATIVE

By George H. Clark

THE principal purpose of an evaporative condenser is to save water, which is used in large quantities by water-cooled condensers. Where the cost of water is comparatively high, it is quite an important factor in the operating cost of refrigerating systems. For machines ranging from 10 to 15 tons, the water consumption may be expected to exceed 1000 gallons per hour.

In many cities the capacity of the water pumping systems may not be great enough to adequately take care of normal city requirements, plus the use of extra water for air conditioning, which may range from thousands to millions of gallons of water per hour, depending upon the size of the

city and the use of water-cooled refrigerating machines.

Then, too, the water from the condensers is usually piped from the condenser to the drain, and in some cities which have outgrown their drainage systems the dumping of thousands to millions of gallons of water per hour into the drainage system may overtax this system so that some regulation of its use for condenser cooling water is required.

Ice-making plants, as a matter of economy, for years have used cooling towers to cut down water consumption. These towers economize on water by disposing of heat through evaporation of part of the water circulated to the cooling tower in order to cool the balance of the water. Figure I shows an elementary cooling tower.

If we assume refrigerant is being condensed in the water-cooled condenser at 100° F., it is reasonable that the water from the condenser will be at about 90° F. The water is sprayed over baffles, as shown, so that the surrounding air, at 90° F. and 50% R.H., passes through the baffles.

Air at this condition, according to the psychrometric chart, has a wet bulb temperature of 75° F., so that the water in the cooled water storage tank will be cooled to within about 2° of the air wet bulb temperature, or 77° F. Each pound of water in circulating then picks up 13 B.T.U. to be reheated to 90° as it comes back to the cooling tower.

The latent heat of evaporation for water at evaporation temperature that exists in cooling towers is approximately 1050 B.T.U. lb., so that to cool water from 90° to 77° will require the evaporation of approximately 13-1050 pounds of water, or about .012 lbs. of water per pound of water to the cooling tower. In addi-

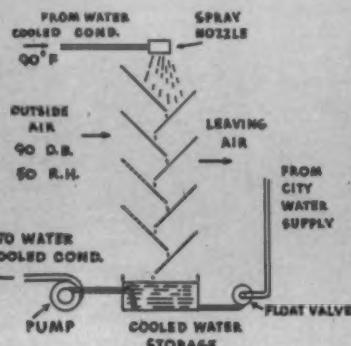


Figure I

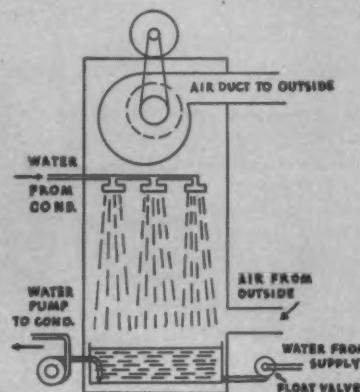


Figure II

CONDENSERS

Ever wonder just how this evaporative condenser idea came about? Here, in not-too-technical terms, is the story of its development, its growth and its advantages. Treat yourself to a "short course" in the "why" of it all

tion, water will be lost as entrained moisture or mist in the air. This loss may range from a minimum of one tenth of one percent to 3% of the total water circulated. This wastage, then, would range from .001 x to .03 lbs. of water per pound to the tower.

The float valve shown would have to supply from a minimum of .012 plus .001, or .013, to a maximum of .012 plus .030, or .042 pounds of water per pound of water to the tower. The actual condenser heat removed per pound of water used is then 13.013 or 1000 to 13.042 or about 310. This compares with a normal heat removal of 20 to 30 B.T.U. per pound of water for normal water-cooled condenser operation. The use of water is thereby reduced to from 3 to 7% of the water usage for normal water-cooled condenser operation.

For power plant use, several variations of the spray tower are used for heat removal where the plant is not close to a body of water sufficiently large to dump large quantities of heat into it. These variations generally

take the form of spray ponds, in which water from the condensers is sprayed over the surface of the pond by a system of pipes and nozzles, and the water to the condensers comes direct from the pond. A small stream into the pond may then supply the necessary make-up water.

For small commercial cooling systems, a compact type of cooling tower or spray pond is shown in Figure II. In this case, a motor-driven centrifugal blower causes air from outside to be drawn by the water spray from the nozzles which cools the water falling into the tank at the bottom. This type of water economizer may be fed from an available water supply through a float valve which controls the amount of make-up, or in instances where no pumped water supply is available, the bottom reservoir may be filled by hand once a day.

The evaporative condenser makes

use of the principle of evaporation of water, as does the cooling tower or spray pond, but is still more effective in that it tends to lower the condensing temperature to about 10° to 20° above the wet-bulb temperature of the air. The evaporative condenser is essentially an air-cooled condenser with water sprayed over the surface, so that the heat of condensation is dissipated directly by evaporation of the water on the surface of the condenser at a temperature within 2 to 5° of the wet-bulb temperature of the air over the condenser.

Early experience in refrigeration service brought to light many instances in which the air-cooled condensing units used in apartment house multiple installations were of insufficient capacity during hot weather to make ice cubes, and also maintain reasonably cool refrigerators. In

Continued on page 44

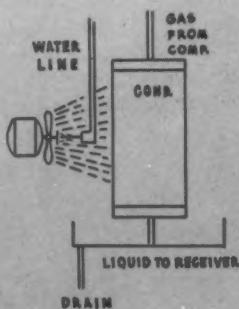


Figure III

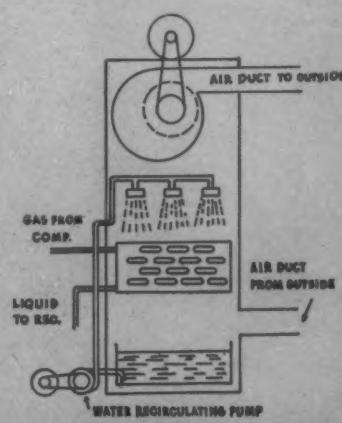
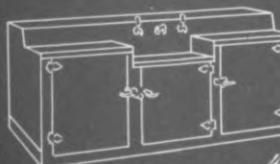
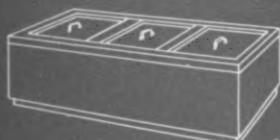
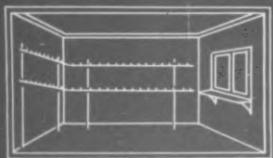


Figure IV

DECEMBER MEMO

Contact Albert H. Bromann Jr. he
handling products - custom built cooling
rooms and freezing cabinets, also cold
storage doors and beer dispensers.
Good line - profits promising



HERE'S A MEMO, made to order for refrigeration contractors, service organizations and fixture and equipment dealers who are planning for the future. Substantial *protected* profits and the prestige derived from handling one of the refrigeration industry's outstanding lines are in store for dealers handling Albert H. Bromann Jr. products.

The Albert H. Bromann Jr. products soon to be available will embody design refinements and quality materials that will make them well worth waiting for. The experienced engineering and skillful workmanship that have distinguished the products of this organization in the past will assure even finer quality when production gets under way in our new manufacturing plant which is scheduled for early completion.

Custom Built Products

- 1 Complete Cooling Rooms
- 2 Cabinets for Industrial and Commercial Freezers

Standard Products

- 3 Cold Storage Doors
- 4 Direct Draw Beer Dispensers

Of particular interest to you because it protects your profits is the Albert H. Bromann Jr. policy of selling only through recognized, established refrigeration outlets. No product of this organization will be sold direct to users at any time under any circumstances.

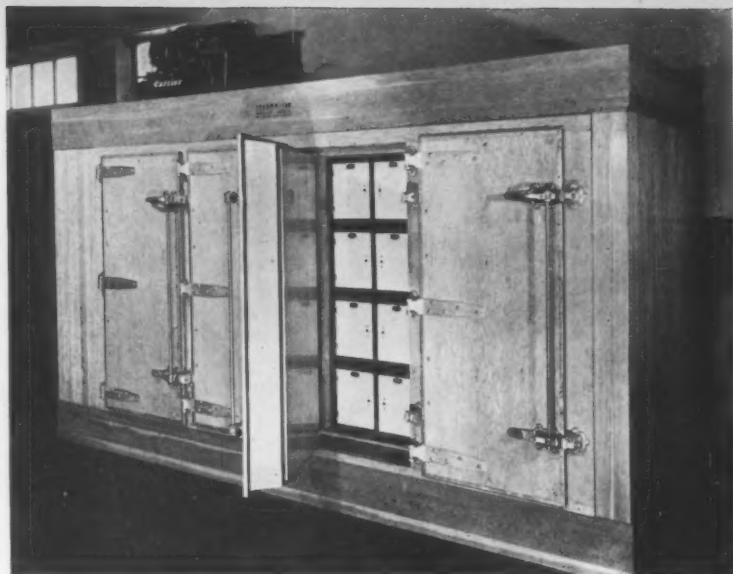
If you are interested in handling one of the outstanding quality lines in the refrigeration field on a protected-profit basis, we cordially invite you to get in touch with us.

ALBERT H. BROMANN JR.

GENERAL OFFICES: 4822 WEST CHICAGO AVENUE • CHICAGO 51, ILLINOIS

Here is the original apartment locker installation made by Air Comfort Corp. Note the "up-front" location of individual lockers and condensing unit atop the enclosure. This unit houses 32 three-foot drawers.

Don't pity the poor apartment dweller . . . for now he, too, can have all the frozen foods he wants, and never have to go shopping unless he wants to. Here's an interesting foods-and-locker sales combination



LOCKERS in the BASEMENT

BIG city apartment-house dwellers—some of them, that is—can now have locker storage facilities right under the same roof with them.

After pioneering an initial installation of 32 lockers in one apartment house early this year, Air Comfort Corp., Chicago, is now installing facilities of similar type in four more apartment buildings in that city. The apartment house-locker merchandising idea, developed by H. E. Wheeler, Air Comfort Corp. president, is an interesting combination of locker storage facilities and regular deliveries of frozen foods to apartment tenants who rent the lockers—with the locker renter, in many instances, never having any personal contact with the firm supplying the frozen foods.

The Original Installation

The original installation, made in the basement of an apartment building at 180 E. Delaware, has 32 lockers of 3-cu. ft. capacity—half the size of those usually rented in locker storage plants—installed in a cabinet-like enclosure, as illustrated. The cabinet has four large cold-storage type doors, which when opened allow the patron to use his own individual locker without entering the refrigerated space. Each door covers two banks of four lockers each.

Apartment tenants who rent one

of the lockers can either buy their frozen foods at a retail store, or make use of the services of a frozen food delivery service (in this case Freezer Foods, Inc., of Hubbard Woods, Ill.) which has obtained the concession from Air Comfort Corp.

If he uses this delivery service, the tenant-renter orders his frozen foods by mail from an order-blank sent to him at regular intervals, and deliveries are made every two weeks. Actually, he need never see the foods until he takes them out of his locker. Each renter has a pass key for his own locker, and Air Comfort Corp. has the single master pass-key. The frozen foods delivery service, in filling orders, makes use of the master key by arrangement with Air Comfort Corp.

Although at the outset Air Comfort Corp. also handled deliveries of frozen foods to the original installation, it was never the company's intention to continue this service beyond the point where certain operating data were obtained, Mr. Wheeler explains. He says, however, that it is the food concession that holds the key to profits in this type of installation.

By retaining the title to the equipment and possession of the master pass-key, the firm installing the equipment has a considerable volume of regular business to guarantee to the

frozen foods distributor. The market for the refrigeration equipment itself, Mr. Wheeler says, is not overly large. In Chicago, for example, there are some 1,100 apartment buildings with 40 or more apartments. Buildings with fewer than this number of dwelling units are not likely prospects, he asserts—the best markets are in the units with 60 to 80 dwelling units.

Supposing that 10% of the "eligible" apartments were sold, this would narrow the actual number of installations to perhaps 100. Merely selling and installing the units, in the long run, would not amount to too much.

Steady Revenue Source

By retaining ownership of the installation, however, the installing firm gets the revenue from the locker rentals plus a continuing income from the rights to the frozen foods concession. Locker rentals, for the original installation, were set at \$2 per locker per month.

In making the original installation, the apartment building operator was given a nominal fee for permitting the lockers to be put in the building. As the idea becomes competitive among operators, however, Mr. Wheeler believes that such a fee may not always be necessary. Original promotion among tenants was done

Continued on page 47



Minor T. Dow, former liaison specialist between the Airtemp home office and various national war agencies in Washington during the emergency period, has been appointed manager of sales training for Air-



Mr. Dow



Mr. Bartels

temp, with headquarters at Dayton.

William C. Bartels, formerly with Cutler-Hammer, Milwaukee, and before that advertising and sales promotion manager for Wisconsin Power & Light Co., Madison, also has joined Airtemp's merchandising staff.

Under Mr. Dow's direction, Airtemp will establish a comprehensive sales training program which will provide information on products, policy, merchandising plans, sales presentation, application engineering and field service operations. The program is designed to benefit dealers' personnel, regional managers, district representatives, field engineers, service representatives, and department heads.

Stephen J. Benn, who has since 1921 been connected with several companies as chief engineer and other executive positions in the field of refrigeration, ventilating, air conditioning, of food processing and allied fields, as well as product design and plant systemizing, has entered his own business as consultant engineer, developing post war products.

Appointment of Joseph C. Cooper and Howard C. Curran as Williams-Oil-O-Matic district representatives was announced recently by W. A. Matheson, vice president of

that division of Eureka Vacuum Cleaner Co.

Mr. Cooper will supervise the New England territory of the company, and Mr. Curran will be Midwestern district manager. Both men will carry on their work under the direction of C. W. Cornelissen, heating sales manager.

W. Bergman Co., Inc. of Buffalo, distributor for Philco products, announce the appointment of **Richard Levy** as parts division manager. Mr. Levy returns to the firm after a three-year leave-of-absence during which time he served as a radio technician with the Signal Corps and the Army Air Forces.

Appointment of E. G. "Red" Haight as sales engineer, contract sales division, has been announced by Edward R. Legg, Kelvinator assistant general sales manager. Mr. Haight was formerly chief application engineer of Universal

Cooler Corp. He joined Universal in 1935 as assistant service manager and later became assistant sales manager.

Mr. Haight entered the refrigeration business with Copeland Products Corp. in Detroit. He remained with Copeland until joining Universal Cooler, serving in various engineering capacities and as field service representative.

H. J. Fitzpatrick, formerly works manager of Plant 9 of Crosley Corp. in Cincinnati, has been named works manager of all Crosley plants in Cincinnati.

Hotpoint has announced the appointment of **H. L. Cushing** as district sales manager, Dallas, Tex.

Harold B. Cromleigh, district sales manager, Philadelphia; **D. C. Risher**, district sales manager, Charlotte, N. C.; and **Samuel J. Houston**, general representative for the eastern region with headquarters at the company's New York office.

After four and one-half years in the armed forces, **H. E. Ferrill** has returned to Kerotest Mfg. Co., Pittsburgh, as sales and development engineer of the brass division, according to announcement by George R. Allen, general sales manager of the Kerotest brass division.

S. J. Seibert has been appointed manager of the service department of Deepfreeze division of Motor Products Corp. Mr. Seibert was formerly manager of the industrial sales division.



Mr. Seibert



Mr. Whitcomb

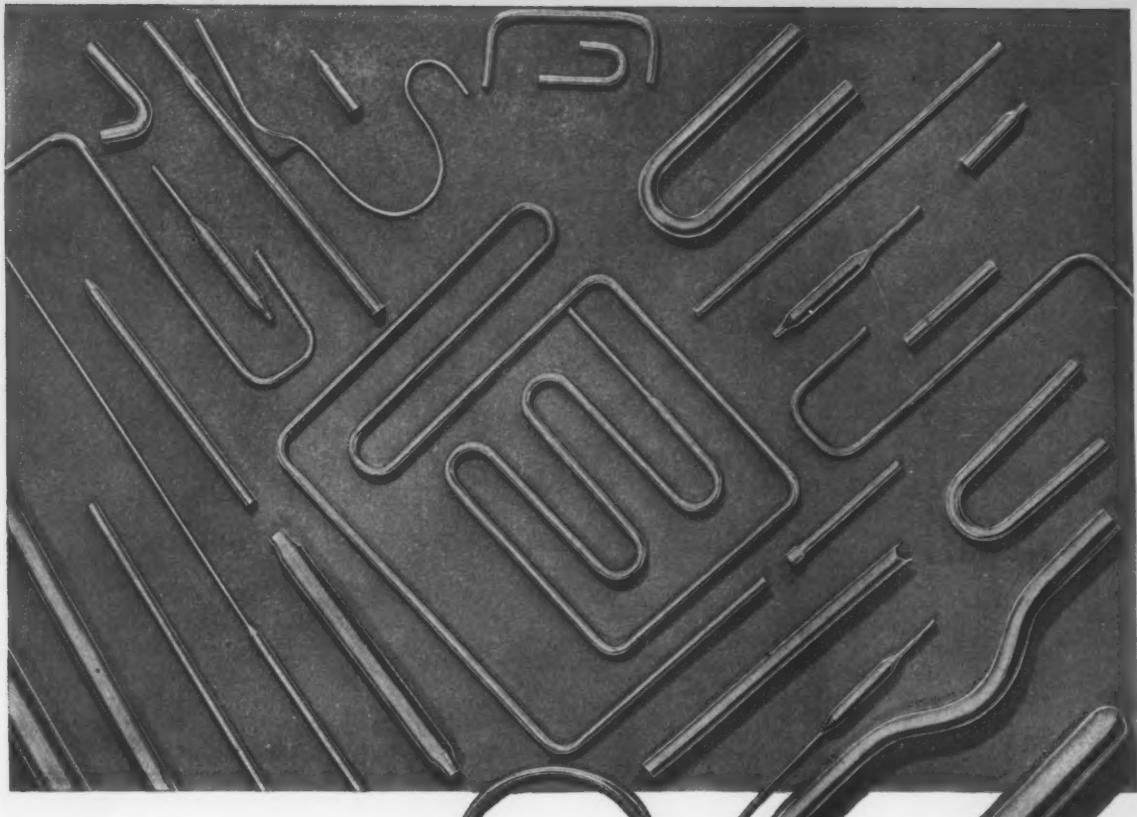
F. W. Whitcomb has been appointed manager of the industrial sales division of the company. He was formerly sales manager of the industrial sales division.

J. H. Moloney has been named general sales manager and **C. L. White** appliance sales manager of the Detroit branch of Frigidaire Division, General Motors Corp.

Guy W. Wolf is the new president-secretary and **Harry C. Lacey** treasurer of the Appliance Dealers Trade Association, Oakland, California. Directors include Max Belling, R. H. Biggs, L. J. Breuner, E. H. Gross, L. W. Hink, L. W. Ling, O. E. Lucas, Fred Maggiola, F. R. McGrew, John Nebeling, J. C. Strohmaier and C. H. Uridge.

M. C. Turpin has been appointed assistant secretary of American Society of Refrigerating Engineers, with headquarters in New York City. Mr. Turpin, who had previously been

Continued on page 52



SPECIALISTS...

in precision-made *Formed* Tubes

Copper, Brass, Bronze and Copper-Nickel Alloys in sizes from .015" O.D. to 1" O.D., with wall thickness down to .003". Ready-to-install units to your specifications. Extra long coils of Copper Tube from 300 to 2500 feet in length. Capillary and Restrictor Tubes, Bourdon Tubes, Thermal Expansion

Bulbs, Specially Shaped Grid Coils . . . and, of course, Anaconda Dehydrated Copper Refrigeration Tubes with the famous Cup Seal*. * Patent Applied For.



Precision tubes are our business, and we'll be glad to talk about them with you. 46396



Anaconda Refrigeration Tubes

FRENCH SMALL TUBE BRANCH OF THE AMERICAN BRASS COMPANY

Subsidiary of Anaconda Copper Mining Company—General Offices: Waterbury 88, Connecticut

In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.



SUN REFRIGERATION LUBRICANT...

Keeps Compressor Parts Clean, Eliminates Sluggishness, Cuts Oil-Consumption 25%

An ammonia-compressor, operating 24 hours a day in an eastern plant, had to be shut down every six months to remove carbon and sludge. Three different competitive brands of oil were tried, but the compressor still was sluggish.

A Sun Engineer was called in and recommended a Suniso Oil, especially developed to resist the heat and pressure in compressor cylinders. This oil has low carbon residue, does not form hard deposits, and resists breaking down into sludge.

After the switch to Suniso Oil, the compressor ran for ten months, and then showed only a clear film of oil

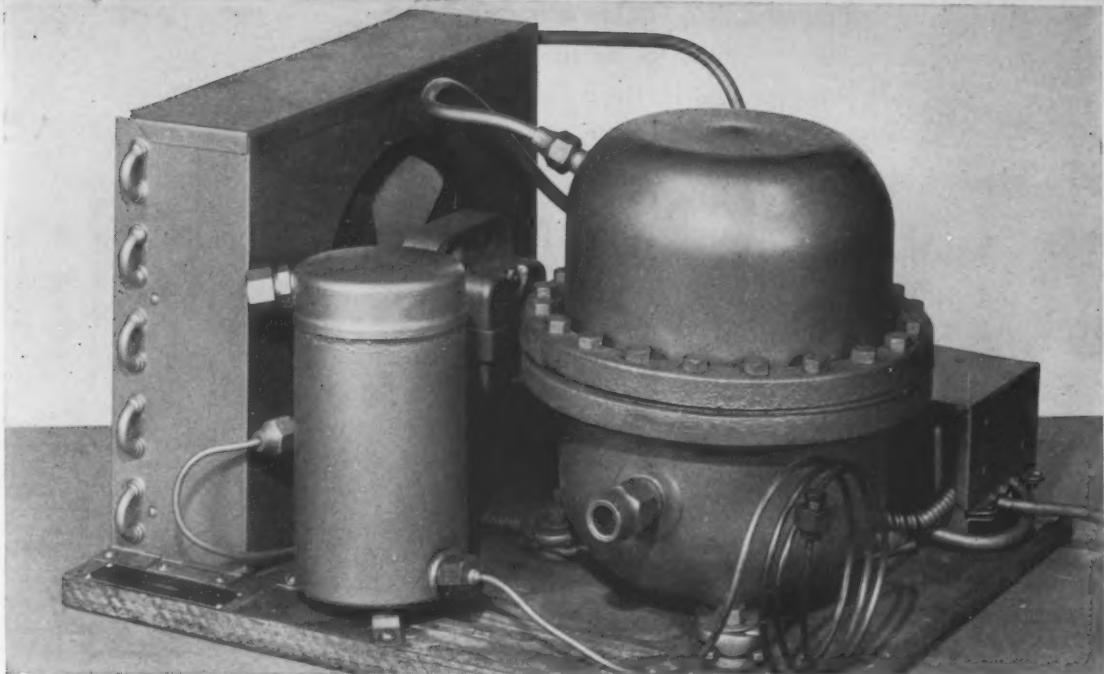
on valves, valve-seats, rings, etc. Oil-consumption was cut 25%. Carbon and sludge disappeared. Operators no longer complained of sluggish performance.

Better operation, less maintenance-expense, and lowered oil-consumption are typical of results obtained with Suniso Oils in cooling-systems of all sorts and sizes. Complete data on lubrication of refrigerating-equipment is available, free, on request, in a 48-page Sun Technical Bulletin. Call the Sun Engineer in your neighborhood, or write direct to

SUN OIL COMPANY • Philadelphia 3, Pa.
Sponsors of the Sunoco News-Voice of the Air—Lorall Thomas



SUNOCO → SUN INDUSTRIAL PRODUCTS
OILS FOR AMERICAN INDUSTRY



Model "W" Grunow condensing unit, used on 1936 models. (Photo from Grunow Authorized Service, Inc.)

Profits in GRUNOW Service

By Elmer H. Wiedwald

THE usual places for leaks on a "D" are the earlier type condenser as described previously, and the $\frac{3}{16}$ " soft solder joint at the liquid line as it enters the rear of the cabinet. If the solder fitting has been mutilated or rounded off, flare one end of a piece of $\frac{1}{4}$ " tubing about 2" long, and swedge the other end out for $\frac{3}{16}$ ". You can either silver or soft solder this to the liquid line after cleaning off all the old scale and solder. This will necessitate using a $\frac{1}{4}$ " flare union. Any shortage of carrene can be added directly to the float or meter.

C. *Noisy.* The Model "D" pump is supported by four rubber mountings which, after a period of years, allow the base to settle and ride on the cabinet. This results in a low pitched hum and vibration in the box. To correct this, simply loosen the four support screws about a quarter inch.

The suction line will also cause a low pitched hum which can be remedied by shifting the line a little. Another source of noise is the fan. In some cases, the fan blade will work

Concluding a series outlining common servicing problems and how to solve them

loose from the hub or the set screw will back off resulting in a high pitched rattle. Simply hold the fan to see if the noise is located there. If so, the wisest procedure is to change the entire assembly, since the bearings also may be starting to wear.

In low ambient temperatures, the compressor will clatter for perhaps 5 or 10 minutes before quieting down. Either remove the refrigerator to a warmer spot, or instruct the customer as to the damage that can occur to the compressor if the box is operated in cold rooms. This rattle will sometimes appear in rooms with temperatures as high as 65° F.

If the compressor vanes rattle when the machine is shut off, check for air

in the system or restricted condenser or drier. If these check out O.K., either the vane buffer springs have been removed, or the pump is becoming inefficient. If the original factory equipment is still in use, the pump is probably going bad.

D. *Overload Kicks Out.* This could be the result of:

- (1) Stalled or slow-running fan.
- (2) Air in the system.
- (3) Restricted condenser or drier.
- (4) Restricted Carrene meter (horizontal type).
- (5) Dirty condenser or restricted air flow.
- (6) Relay fails to drop. This may be due to a tight condition in the pump or the impedance of the rotor is so high that the running current is of such value as to keep the relay contacts closed. Very little trouble has been experienced with the starting box mechanism, but before changing the compressor, check it with another relay assembly which you know to be good. Check line

Continued on page 48

Here's a new and fast-growing field—turkey processing—that offers large and promising possibilities for the alert refrigeration contractor. One such firm, the Paul H. Hupp Co., has literally grown up with the field in its territory. Learn about a job as this firm does it

By L. H. Houck

OF THE twelve refrigerated turkey processing plants in the state of Utah, seven were designed and built by Paul H. Hupp, of the Paul H. Hupp Co., Salt Lake City.

In 1942 and 1943 turkey production accounted for more than 5% of the state income, when it brought in more than \$6,000,000. Sales and production were higher in 1944 and 1945.

Several new processing plants are now under construction. Not all of them are alike and not all of them perform the same function. Some of the new ones will deal with production that will make it possible to buy turkey meat by the piece.

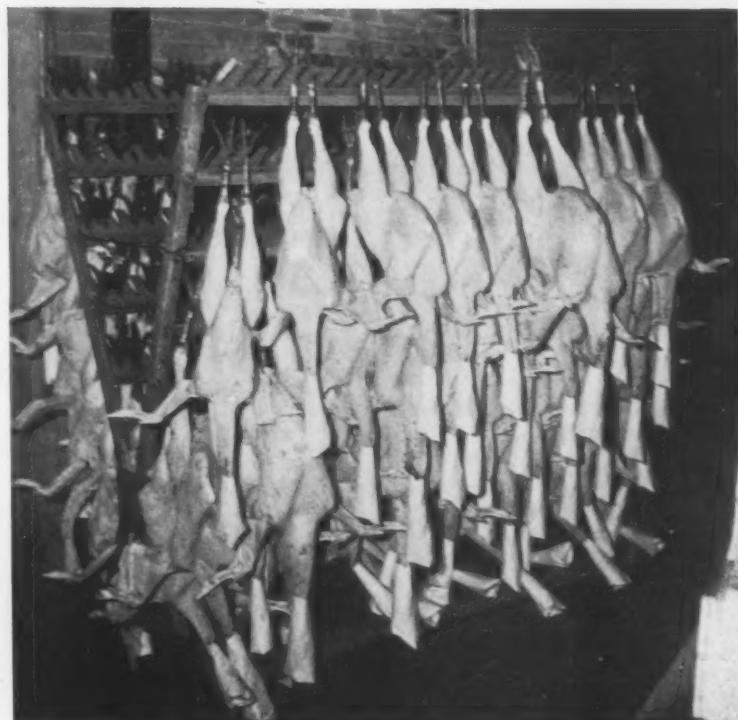
All of them use mechanical refrigeration. All turkey processing plants can be readily adapted for production processing of chickens and other poultry and any refrigeration company anywhere may be called upon at any time to figure a turkey plant or a poultry plant, because this is one of the fastest-growing industries in the country.

Here are the complete technical details of the seventh plant built by Mr. Hupp. While building turkey plants is an important part of his business, it does not dominate it.

This plant was constructed at



Paul H. Hupp, whose company has built seven of the twelve turkey processing plants in Utah.



Turkeys are sent to the chill rooms on racks like these. From there they go to the packing room, where they are packed in boxes and loaded into refrigerator railroad cars for shipment.

Nephi, Utah, 90 miles south of Salt Lake City for the Nephi Processing Corp. Its completed cost, including building, is about \$50,000. It will process \$2 million worth of turkeys a year.

The compressor consists of a 25 h.p. Baker ammonia compressor with a shell-and-tube condenser-receiver.

It is driven with a three phase 220-volt electric motor with five v-belts. It is a twin-cylinder vertical unit, fully enclosed, water-cooled.

Two chill rooms and a packing room are refrigerated; one cooling room is unrefrigerated. The basic work routine is this: Trucks loaded with turkeys back up to docks at the

Turkey IN G

Wide doors like this, with 8-inch insulation, make entrance easy to chill and packing rooms in the plant.

rear of the building. The turkeys are unloaded and hung by the feet on a chain conveyor. First step is killing. The chain moves the birds then consecutively into the scalding vat, into the automatic picker, which removes most of the feathers, then by the hand pickers, who inspect and finish. They also pass through a heat drier. Some plants dip the birds in hot wax, some don't. The value of the hot wax dip is to remove pin feathers. After cooling the wax is removed and all

The power behind the plant—a 25 H.P. ammonia compressor, driven by a 3-phase, 220-volt motor.

the pin feathers come with it.

So from a refrigeration standpoint, the bird must be reduced quickly from a blood temperature of about 101° F. to about 32°, but not colder, for reasons which will be outlined below.

The Nephi plant is designed to handle 60,000 turkeys a day, or about two carloads.

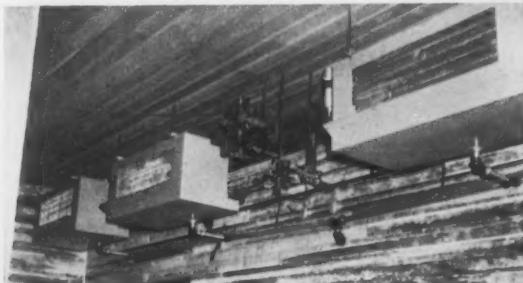
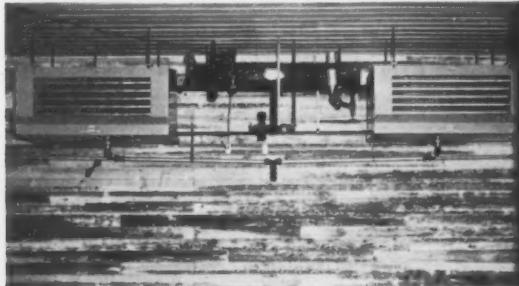
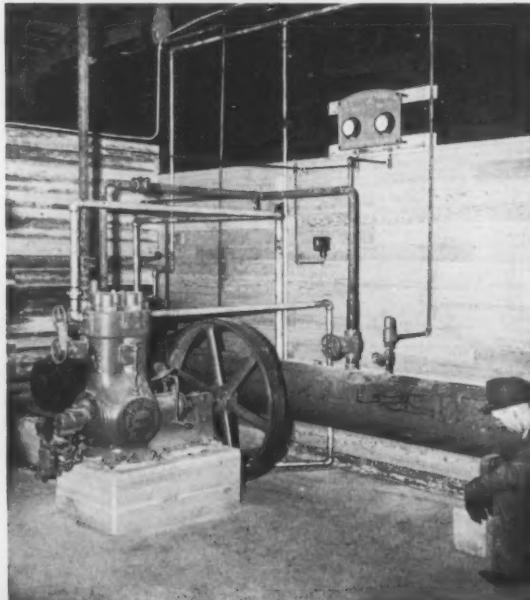
Two chill rooms are provided. This makes it possible to pack from one room while another is being filled, and eliminates the necessity of

putting warm turkeys in with turkeys that are chilled. Turkeys are stored on racks containing room for about 1000 pounds.

Each chill room is cooled with four Recold water-defrost fan-type units, adapted to float control. This is an injector system with some design and variations introduced by Mr. Hupp.

The surge drum is mounted hori-

Above and below are two views of chill rooms in the Nephi Processing Co. plant. Four water-defrost unit coolers handle the job. Surge tank is shown in center.



STRAP-HANGERS' PARADISE



The world's first air conditioned trackless trolley has made transportation history since it was put into operation recently in Atlanta. Shown here is a side-view of the car, into which was built specially designed Carrier air conditioning equipment. A far cry from the old streetcar, this trolley has a cooling unit installed on the roof, while refrigeration equipment is under the floor. The vehicle was built at the Worcester, Mass. plant of the Standard Mfg. Co.

zontally slightly above the unit coolers. Liquid ammonia level control is maintained by an Alco float switch, which operates a solenoid valve to introduce the liquid ammonia into a liquid header through an injector, which creates increased recirculation of the ammonia through the coils.

Coil temperature is maintained at a predetermined point by a Hubbell combination suction pressure regulator and electric stop valve, which in turn is actuated by a room thermostat. Each of the water-defrost units is equipped with two 16-inch fans, which have an air throw of 25 feet and move about 3900 C.F.M. of air.

With the water defrost system, defrosting is accomplished in five minutes by the use of a cold water spray, controlled through a manual three-way water valve. Method is to stop evaporator fan motors and compressor, open water valve from one to four minutes, and allow one minute for water to drain off.

With four units to each chill room and two fans to each unit, there is violent air agitation in the chill rooms, which promotes quick reduction of the warm turkeys to desired temperature.

"Automatic" Defrosting

At the operating temperature and the way it is hooked up there is almost automatic defrosting, Mr. Hupp said. He said the defrosting was based on the fact that water has 144 B.T.U. of latent heat to give up, which makes it possible to defrost with tap water slightly above the freezing point.

The packing room is cooled by two Recold "Supreme" type units which will operate at 40° F. There has been past trouble in turkey packing rooms with high temperatures caused from workmen shutting off the fans because they didn't like the cold blast. With these units, the air blast is to the ceiling and gives good air distribution at low velocity, which is unobjectionable to the packers.

The packing room is also controlled by a suction pressure regulator and electric stop valves. Compressor is operated by means of a suction pressure pilot switch.

After the turkeys are killed and dried they are cooled down to 90° or less in the unrefrigerated cooling room. This is done with cold water. They are moved as quickly as possible into the chill rooms where they are cooled to an internal temperature of

36°, which requires about 32° room temperature.

By this time someone may be wondering why they have been so careful to keep the temperature at 32° or above. Below that temperature the wing tips of the birds freeze, since they are thin, and when they freeze it not only grades the turkey down but makes it harder to pack.

No part of the turkey is intentionally frozen, so here, at least, is a place where both upper and lower operating temperatures are critical and important.

Field Growing Fast

Selling of turkeys and turkey meat is developing at a rapid rate. A few years ago the average turkey weighed 10 lbs., and the housewife wanted nothing larger than a 14-lb. turkey. Now the average weight is 20 lbs. and some weigh 35 lbs., due to scientific production.

Processing plants operate either for themselves or on a custom basis on a processing charge of 3 cents per pound, and this pays for everything, including refrigeration and boxes and head wraps—so it is easily seen that the refrigeration cost on such a system is reduced to a very small portion of the total cost.

State and national agricultural authorities declare that the expansion of the industry is due largely to the handling of the commercial crop in centrally located processing plants.

It has been only a few years since most turkeys were dressed for market on the farm where they were dry picked. Now there are semi-scald

plants, semi-scald plus wax, dressing plants, and evisceration plants.

Each year shows a substantial increase in the sale of turkey meat at other than holiday seasons. While the big demand remains at Thanksgiving and Christmas seasons, production and processing plants have made it possible to provide this excellent meat throughout the year.

Trend Means Much

Trends such as are indicated here are important to the refrigeration industry because they presage a future demand for improved and specialized equipment.

A competent refrigerator man can take a turkey processing plant and adapt it for ducks, geese or chickens, should it be needed.

He can show a turkey producer who is dry picking turkeys in an uncertain labor market how he can process them by machinery and keep the product in perfect condition with efficient and specialized refrigeration.

Mr. Hupp has been in the refrigeration business in Salt Lake City for about 16 years. His oldest turkey processing plant job is about 12 years old; most of them are comparatively new.

"New designs have been used every year," Mr. Hupp said, "and we are continually finding better ways to accomplish the purpose and to solve the problems of the turkey processor. It seems that every time a problem is solved, turkey production goes up another notch. Every time it goes up, somebody has to design a new processing plant."

FIRST LEHIGH UNIT IS 3-H.P. MACHINE

Climaxing several months of re-conversion operations in which management, engineering, and labor each played an important part, Lehigh Foundries, Inc., has announced the completion of its first post-war commercial condensing unit. This unit is a heavy $\frac{1}{3}$ H.P. compressor assembly, which, with a $\frac{1}{2}$ H.P. unit, will constitute the two sizes to be manufactured for the balance of this year. The complete line of LEHIGH compressors will include $\frac{1}{4}$ H.P. units through to 5 H.P.

Initial production meets to a day the schedule set on May 1 of this year when Lehigh acquired the condensing manufacturing facilities of Merchant & Evans at Lancaster, Pa., reports J. C. Miller, general manager.

Lehigh Foundries also recently announced completion of negotiations with the R.F.C. for the operation of the new electric foundry adjacent to its properties in Easton, Pa. This foundry, erected in early 1945 to be operated by Lehigh for additional shell production, will approximately double foundry capacity.

All castings will be made in Easton, where they will be normalized and, in some cases, rough machined. Final machining, assembly testing, and shipping, will be done at the Lancaster plant. Showrooms and general offices will also be maintained at Lancaster.

SHOE STORES PLAN POSTWAR COOLING

Most retail shoe stores in the nation are planning extensive postwar re-decoration and remodeling, and many are considering the installation of air conditioning, according to a recent survey made by the *Boot and Shoe Recorder* trade journal.

Because of a typographical error, credit for the photographs illustrating the article "Help Yourself to Bigger Profits" on pages 36-38 of the November issue was incorrectly attributed to Hassmann Refrigeration, Inc. Correctly, credit for the photos should go to Hussmann Refrigeration, Inc. We sincerely regret the error.

Looking over Lehigh's first postwar condensing unit here are Jack Miller, general manager, refrigeration division; Paul Flamand, production manager; E. E. Griest, vice president, manufacturing; and A. Banyai, chief engineer of Lehigh.



DAVISON'S SILICA GEL



goes further...does more

Davison's Silica Gel was developed under close collaboration with refrigeration engineers who knew only too well the shortcomings of ordinary drying agents... Recognized as a basic contribution to the refrigeration industry, Davison's Silica Gel ends moisture troubles and other danger-creating elements that stop most drying agents.

1—It is processed especially for the dehydration of refrigerants . . . 2—Its scientifically-determined particle size assures you that the refrigerant will not channel—will be distributed evenly throughout the cartridge . . . 3—This even distribution of the refrigerant makes it possible for it to

be in complete contact with the entire pore-surface area at all times . . . 4—It removes acids . . . corrosive compounds and other impurities . . . in addition to moisture . . . instantly . . . 5—Its capacity for moisture is not affected by oil . . . 6—It will not cake nor powder . . . 7—It will not attack metals or alloys . . . 8—Complies with the requirements of joint Army-Navy Specification JAN-D-169-Grade A Type II for Desiccants (activated).

Get the complete drying agent that is effective on Freon, Methyl Chloride, Sulphur Dioxide, etc.; specify Davison's Silica Gel from your jobber—in factory-charged dehydrators or in bulk for refill.

THE DAVISON CHEMICAL CORPORATION
Progress through Chemistry
Canadian exclusive sales agents for DAVISON'S SILICA GEL:
CANADIAN INDUSTRIES LIMITED, General Chemicals Division

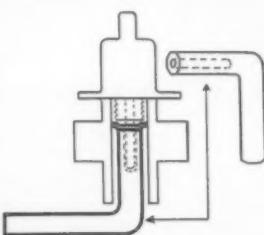
"Let's share our knowledge—exchange our experience"

Here's how

Refrigerator Care Pays Premiums

The magazine *Super Market Merchandising* recently carried a story under the title of this paragraph, listing a number of pertinent maintenance points concerning refrigeration equipment for the guidance of persons responsible for the care of this equipment in super markets.

In this and future *Here's How* departments, we will reproduce certain parts of this article, by permission of that publication. We think you'll find them worthwhile, for two reasons: *first*, the illustrations point up the maintenance problem in first-rate style; *secondly*, all of the points warrant recalling. They're suggestions you can remind your retail food store customers of, regularly. Refrigerator care really *does* pay premiums.



TO REMOVE worn seats from Penn or Electrimatic water condenser valves, I have drilled a hole in the center of my seat-removing tool (as illustrated). This enables me to replace worn seats in the valves without having to remove the bellows.

David Leger, Washington, D.C.

Caution on Motor Rebuilds

Always check repaired motors carefully for rotation. Often during the process of repairing, motor connections are reversed and if installed with improper rotation it is possible

Edited by
Warren W. Farr

to damage many makes of compressors as the oil is not properly circulated, and on air cooled jobs the condenser fan does not function, causing additional overload on the repaired motor.

Postwar Refrigeration Applications

If you are interested in expanding your customer list, here are a few new uses for refrigeration equipment:

Frozen food lockers in apartment buildings; low temperature refrigeration in industrial plants for testing automotive parts for cold climates; new types of air conditioning for department stores and theaters; air conditioning for buses, trackless trolleys and passenger cars; refrigeration for production of penicillin, blood plasma, and whole blood; humidity control and air cooling in printing plants; refrigerated coin machines for automatically dispensing food products; new types of refrigeration for railroads, truckers, and aviation in-

dustries, for delivering foodstuffs in prime condition from coast to coast.

All of these markets are comparatively new, and will add materially to refrigeration sales in the coming months and years. Get your business ready now so that you'll be in shape to handle your share, both from a sales and maintenance standpoint.

Guard Refrigerant Lines. Whenever possible, protect refrigerant lines which are exposed. They are the blood vessels of the cooling



plant and should not be damaged. Make employees conscious of being careful when moving boxes or barrels near the exposed tubing. (From "Refrigerator Care Pays Premiums", *Super Market Merchandising*.)

FIVE DOLLARS REWARD

WILL BE paid by THE REFRIGERATION INDUSTRY for any information on installation or servicing procedures and shortcuts accepted for publication in **HERE'S HOW**, The Service Man's Department.

Send your suggestions on shop equipment and methods, tools, or other ideas to **HERE'S HOW** EDITOR, c/o THE REFRIGERATION INDUSTRY, 812 Huron Rd., Cleveland 15, Ohio.

Take Care of Your Tools

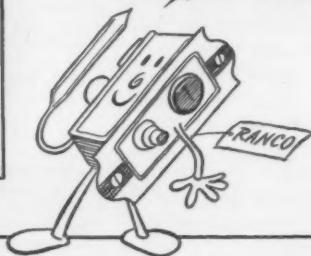
A good mechanic is known by his tools. It's easy to identify the careless and sloppy workman. Bent screw drivers, gauges out of adjustment, battered wrenches and pliers, and a generally mixed-up and haphazardly arranged tool kit—all these are tell-tale signs.

It doesn't matter how much you

THE SERVICE MAN'S DEPARTMENT

1. GOOD MARGIN OF PROFIT.
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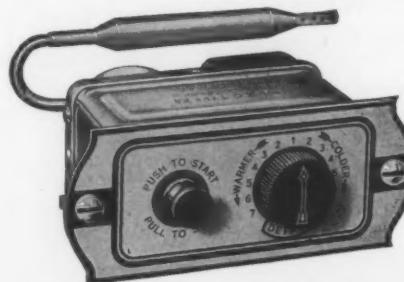
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HOW YOU AND I CAN
MAKE MORE MONEY
FOR YOU — BY
WORKING TOGETHER



It's Just Simple Logic . . .

You want your replacement work to be satisfactory to build consumer good-will; to keep present equipment operating until new units are available; to actually earn and deserve a fair margin of profit. When you install a Ranco Replacement Control you and your customer confidently expect precision, dependability and accuracy.

Your Ranco Jobber carries a more complete line of controls now than during the war; we are striving to increase this supply; but we ask that you accept your Jobber's recommendations when certain instruments are temporarily unavailable.



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may know about refrigeration equipment or how much experience you may have had, you won't be of much help to your customers unless you are able to do something about solving their refrigeration problems. And you can't do much without tools that are adapted and fitted for a particular use. Conversely, the better your tools, the better your job will be.

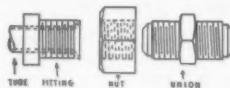
Good quality tools, properly designed and carefully selected, are a good investment that will pay you dividends in faster and better work, time saved and fewer complaints from customers. The fellow who tries to do almost everything with an adjustable wrench, a pair of combination pliers, and a screw driver can expect his share of skinned knuckles, damaged parts and generally less efficient work.

In a future issue we'll have more to say about what a complete set of tools for efficient service work should include.

ONE of the most annoying connections to make is to have to couple an inverted flare nut up to regular flare fittings.

This is the way to do it:

Screw the inverted flare nut half way into a regular nut of the prop-



er size. Then screw a flare union of the same tube size as the inverted flare nut into the nut, and tighten it.

You are now all set to couple up the union with a regular flare nut.

E. A. Wenk, New York City

The Customer's Confidence

The past couple of years have been trying times for all of us—and that includes our customers, in a good many instances. It may be that in the rush of getting things done, handicapped as we were by the lack of time, shortage of materials, and sometimes inexperienced workmen, we may have taken for granted, and therefore overlooked, a very important point; the building up, in the customer's mind, of confidence in the work we're doing for him.

To the experienced refrigeration man, most of his repair jobs are pretty much routine. So when he was rushed his tendency naturally was to get the job done without talking to

the customer too much about what he was doing. Many times it was only a minor adjustment that put the system back into proper operation, and the customer, not knowing much about what was going on, might be

THERE are many older style refrigerators on the market that have hinges constructed of either cast or stamped brass. Due to the normal wear over a period of years, the bottom half of each hinge will sag and allow the door to sag appreciably. An easy repair job can be made with very little equipment and prove satisfactory for many years of service.

Remove the hinges from the cabinet and dismantle the lead from the butt. Next, build up any of the worn parts with silver solder. Since it is always the bottom hole that usually wears, the best procedure is to fill up this hole completely and use the top hole as a guide for drilling out to the correct size. Nearly all of the hinge pins are $3/16$ ", $1/4$ " or $5/16$ " stock, so that a short piece of brass or steel stock of each size will be sufficient for a good number of hinges.

Before assembly, smooth down the bearing surface of the butt with a file and insert on each leaf a small thrust washer of the proper size, so that the wear in the future will be on that gasket instead of the butt. When assembling the pin, place a small amount of light vaseline on the wearing surface to increase the life of the hinge.

E. H. Wiedwald, Cleveland, Ohio

inclined to under-rate the repair job, especially when he got the bill.

Even when you're rushed, it pays to take a few minutes to explain to the customer what's the matter with his job and how you're going to remedy the trouble. There are a lot of "experts" who never had a wrench in their hands, but they like to tell you what they think is the matter with the job. If you will take a minute or so to explain what the trouble really is (agreeing with the customer, of course, wherever possible) you'll find the time well spent. It will convince him that you really know your business.

Care of Files

File life is greatly shortened by improper care as well as by improper use—and by using the wrong file on the job. Never throw your files into a drawer or tool box containing other tools. Don't stack them against each other. Such treatment ruins the cutting edges of their teeth.

In the shop, keep files separate—standing with their tangs in a row of

holes, or hung on a rack by their handles. Keep them in a dry place so rust will not corrode the points of the teeth.

Files should also be kept clean of filings or chips, which often collect between the teeth during use. A good mechanic taps the end of the file on the bench after every few strokes to loosen these chips. Use a file card or scorer to keep your files clean. Oil or grease may be removed with chalk.

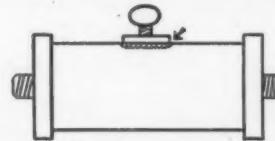
Cooling Aids Efficiency

Air conditioning, installed in the drafting room of a war plant to protect sensitive blueprint and drawing papers, increased the efficiency of the men who worked in the room by 51.4% after the system was installed.

This is just another proof that

QUIT of something over 4,000 domestic units in this district to keep in service, we now and then run across a rotary type compressor with a clogged oil line; this usually is a model having an external motor. After getting the oil line open and the compressor to turn freely, very often the suction side runs a 20 or 30 pound pressure plus.

To get enough oil to the blades



to form a seal, I improvised the illustrated oil injecting device. It is merely a small size dehydrator that has been emptied and washed out with carbon-tet. A $3/8$ collar is soldered in one side to accommodate a heavy-winged bronze plug.

This injector is hooked on in a horizontal position between the gas bottle and service valve; the plug is removed and the right grade of oil poured in the dryer shell until full. Air is purged out of the entire hook-up by means of this filler plug, both from the bottle and compressor by opening and closing the respective valves.

This will give enough vacuum to pump down the evaporator and pick the full supply of lubricant in the system.

Joe W. Langford, Waco, Tex.

human efficiency, as well as mechanical efficiency, is increased by business air conditioning. Now that companies are returning to civilian production, this fact assumes added importance and provides another sales point for you to use in lining up these jobs in your territory.



GOVERNOR MEETS ADMIRAL. Gov. Gates of Indiana (right) accepts Admiral Corp's. first 1946 refrigerator from President Ross D. Siragusa. The unit went to Indiana Girls' School.

IMPROVISING . . .

Continued from page 25

means, Maj. Firebaugh had scroungers out 24 hours a day with orders to "appropriate" or requisition necessary materials when they found them. Finally the needed materials were assembled.

The plant originally had a capacity of 250 tons of ice per day; the rebuilt plant had a capacity of 50 tons daily. Another problem in this respect was ammonia—the Japanese ammonia became useless after a few days of operation because of the separation of the nitrogen. Ten thousand pounds of ammonia (made in USA) were flown up from New Guinea, and 8000 lbs. were used to charge the system. No refrigerant oil was available, so the system was started up on S.A.E.20 automotive oil. This was used until a supply of refrigerant oil was obtained.

Then there was no supply of calcium for charging the ice tanks. Finally, the men obtained 4000 lbs. of table salt in 200-lb. bags and used this for the brine solution. Maj. Firebaugh believes this is the first refrigeration plant that was ever charged with table salt.

Two direct current generators were in the plant, one of 120 and one of 240 K.W., Diesel-driven. These were patched up so they would operate at about $\frac{3}{4}$ capacity. The rebuilding crew had to make carbons and other small parts necessary to get the units into operating condition.

Now the plant was ready to go, but there was still another problem. Cold storage rooms were located on three separate floors, and there were no ele-

vators in operation, all of them having been wrecked beyond repair. The front section of the building had been occupied by a beverage bottling plant, which had an endless conveyor. This was re-erected at the rear of the building, equipped with motors, and the food and other supplies hoisted to the upper floors in this manner. To bring the materials down, the process was reversed.

The plant was finished just in time—for on the twenty-first day after Manila was liberated, 3,000,000 lbs. of beef arrived for storage. Penicillin

valued at \$1,000,000 was also stored in the rooms, in addition to blood plasma, fresh blood, and other medical supplies.

Maj. Firebaugh says he believes this was the first large plant to be put back into operation in Manila after the Japs had been driven out. Certainly, he says, refrigeration was the first major industry to get going again. Once the plant was operating, he says, things went along without too much trouble—but he admits he'd much rather think about a job like that than do it over again.

KNOW YOUR REFRIGERANT CORROSION LIMITS

EFFECTS OF MOISTURE

Moisture in a refrigerating system may cause any or all of the following:

1. Freezing up at expansion valve or capillary tube, ice in the evaporators.
2. Corrosion of metals to form sludge.
3. Copper Plating.

RESULTS OF TESTS CONDUCTED ON STEEL

Refrigerant	% Water by Weight	Results
Sulfur Dioxide	.003 .010 .015	Slight discoloration Slight scale Heavy scale Presence of air did not affect results
Methyl Chloride	0.02 0.03 0.05	Slight discoloration Marked discoloration Very slight scale Moderate to heavy scale Presence of air increased corrosion in all cases
"Freon-12"		Similar to methyl chloride

FACTS REVEALED

1. Corrosion of metals occurs whenever the amount of water present exceeds fairly well defined limits.
2. Water reacts with sulfur dioxide, methyl chloride, "Freon-12" and other refrigerants to form acids.
3. These acids react with steel, copper, and aluminum parts of a refrigerating system to form definite metallic salts (sludges).
4. In a sulfur dioxide system the amount of moisture tolerable is higher than in a methyl chloride or "Freon-12" system but corrosion, once begun, proceeds more rapidly in a sulfur dioxide system.
5. Corrosion in a butane or isobutane system is due to the direct action of the water and perhaps air, on metals.
6. Moisture tolerances are higher for copper, brass and aluminum than for steel.
7. Moisture tolerances are lower at higher temperatures found in condenser and compressor than at room temperature.
8. Corrosion is much worse in the presence of air in all refrigerants except sulfur dioxide.
9. Approximately 90% of the sludges produced in refrigerating systems are due to moisture; the others are associated with oil and minor causes.



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MARINETTE, WISCONSIN
AGENTS FOR KINETIC'S "FREON-11," "FREON-12" AND "FREON-22"

EVAPORATIVE CONDENSERS

Continued from page 29

stances of $\frac{1}{4}$ H.P. air-cooled units operating four refrigerators or $\frac{1}{2}$ H.P. air-cooled units operating eight to 10 refrigerators were not at all uncommon in those days.

When the condensing temperature is low, the machines have sufficient capacity to pull the evaporator temperatures down and occasionally to shut down, but when the air temperature by the condensers gets up to 100° or higher, the increase in discharge pressure cuts the compressor capacity so much that the evaporators may not get sufficiently cold to freeze ice. Service men and apartment house managers solved this difficulty in many instances by supplying a steady dribble of water from a hose to the air-cooled condensers. In this way the original evaporative condenser was born.

An early type of evaporative condenser, as of about 10 years ago, was essentially as shown by Figure III. This is a normal air-cooled condenser with a separate fan motor, and a

target attached to the fan. A jet of water impinges on the target, is picked up by the air and is partially evaporated on the condenser surface. The excess water passes into a drain.

CROSLEY CORP. has authorized a number of its larger distributors to repair, in their own service departments, Crosley sealed-in unit refrigerating systems which had formerly been sent back to the factory in Cincinnati for servicing.

Servicing the units in local areas saves both time and expense in shipping, to the advantage of the customer, according to H. A. Newell, Crosley general service manager. It is understood that the company's ultimate aim is to permit 100% field repair of the sealed-in refrigerating systems.

According to Mr. Newell, present experience indicates that 85% of the sealed-in units can be serviced in the field.

A more modern type of evaporative condenser consists in just a minor variation from the water economizer shown in Figure II. Figure IV shows

the essential elements of this evaporative condenser.

For the condenser as shown by Figure IV, we can assume several different entering air conditions and estimate the effects in condensing.

If the entering air was at a temperature of 100° F., and the relative humidity is 60%, the wet-bulb temperature would be about 88° , which is probably as high or higher than any habitable spot on the earth's surface. Under this condition, and enough condenser surface for the load being handled, a condensing temperature of about 97° to 100° should obtain. This is the equivalent of an air-cooled condenser in an 80° room.

If the refrigerating unit is handling 10 tons of refrigeration or removing (10×200) 2000 B.T.U. per minute, the heat the condenser would have to pick up might be from 20% to 60% greater, depending upon evaporating conditions. Assuming 40%, the condenser load would be 1.40×2000 , or 2800 B.T.U. per minute. The amount of water used to dispose of this quantity of heat in evaporating would be $\frac{2800}{1050}$ about $2\frac{2}{3}$ lbs. per minute.

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for a big, ever-ready supply of cool, clean drinking water... for carefree, quiet-running, low-cost efficiency... for splash-free delivery of water at the angle, height, temperature and pressure that assures maximum drinking ease for the greatest number of people. Other Oasis features include clean-cut, "tailored" construction; compact, space-saving design; rugged, extra-capacity condenser units. Oasis Electric Water Coolers are the result of 20 years of pioneering leadership in the electric water cooler industry — they're an EBCO product. Write for details!

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Hidden leaks in refrigeration equipment cause serious damage to expensive installations and loss of costly products.

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Assuming twice this quantity as entrained moisture loss, the total water to be replaced per minute would be $2\frac{2}{3}$ plus $5\frac{1}{3}$, or 8 lbs. (approximately one gallon) per minute, or 60 gallons per hour.

The air entering at an 88° wet-bulb temperature (100° plus 60% R.H.) should leave the evaporative condenser at about 95° and 95% R.H., or at 93° wet bulb. The heat content of the air leaving at 93° W.B. (from a psychrometric chart) is 58.2 B.T.U. lb. of air, and the heat content of the entering air at 88° W.B. is 51.6 B.T.U. lb. of air. To dispose of 2800 B.T.U. per minute the amount of air per minute would be $\frac{2800}{58.2-51.6}$, or about 425

lbs. per minute. The volume per pound of air from the chart is about 14.75 cu. ft. lb., so that under these extreme conditions the quantity of air to be handled would be 425×14.75 , or 6,270 C.F.M. This in itself would represent a blower load of from 2 to 5 H.P., depending upon size and length of air ducts.

On the other hand, if the entering air was 100° and 10% R.H., as might occur in some of our more arid cli-

mates, the entering wet-bulb temperatures would be about 33°, and condensing temperatures below 40° could be obtained. However, it would probably be more practical to work on condensing temperatures of 60° F., in which case the air might leave at about 58° and 90% R.H. or with a 55° W.B. In this case, the air to be handled, to remove 2800 B.T.U. min.,

would be $\frac{2800}{23.04-12.18}$ or 257 pounds per minute; or at a volume of about 13.2 cu. ft./lb. the volume would be 257×13.2 , or 3,392 C.F.M., about one-half that indicated in the case of the high humidity air. The water requirement per minute would be approximately the same as before.

Most Effective Uses

In any case, the evaporative condenser will be more effective than an air-cooled condenser, as it will tend to condense at temperatures lower than the air dry-bulb temperature. In most instances, the evaporative condenser will be more effective than water-cooled condensers, since in order to conserve water, the condens-

ing temperature is usually maintained high enough to be able to make economical use of the water by being able to add more heat to each pound. A water-cooled condenser may be as effective as an evaporative condenser when an unlimited quantity of water is available at temperatures below the wet-bulb temperature of the air, which is unusual.

Evaporative condensers are economical in water usage in that the quantity of water actually required may vary from one-tenth to about one-thirtieth of the quantity of water used in conventional water-cooled condensers.

The principal disadvantage of evaporative condensers is the comparatively high initial cost and the cost of installation. Also, some type of control may be necessary to prevent overcooling, which is harmful principally in that the very low liquid pressure and partial evaporation taking place in a line passing through a warm atmosphere may cause poor expansion valve operation, or supply insufficient liquid head to cause the liquid to flow up to an evaporator at a high level.

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COLD PLATES

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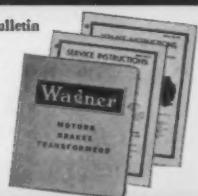


If the equipment you are now manufacturing is essential to war production plants, housing projects, or to the armed forces, Wagner will gladly figure with you on your motor requirements. Consult the nearest of Wagner's 29 branches, located in principal cities and manned by trained field engineers.

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MAS-20

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ELECTRICAL AND AUTOMOTIVE PRODUCTS

SUB-COOLING . . .

Continued from page 27

operating at 105° condensing feeds a coil 20 feet above it and that the liquid is subcooled 5° at the condenser outlet. Twenty feet times 80 lbs. per cu. ft. (density of F-12) equals 1600 lbs. per square foot, or about 11 p.s.i.

The liquid at the valve then is under a pressure of 126 minus 11, or 115 p.s.i. This corresponds to a temperature of 99° F. Actually, pres-

sure drop through the liquid line will further reduce the pressure at the valve, and the liquid will be heated from the friction which causes the pressure drop.

Counteracting these effects will be heat dissipation from liquid line to room, if the latter is below 100° F. This heat dissipation is negligible for the usual temperature ranges. Assuming a $5/8$ " liquid line, 25 feet long, and a 75° room, it equals about 200 B.T.U. per hour (4.08 sq. ft. x (100 - 75) x 2 B.T.U. per hour sq. ft., deg. F). A five-ton system circulates

1110 lb. per hour of Freon-12, so it can be seen that the refrigerant temperature drop due to this cause is but a fraction of a degree.

The liquid in our 20-foot line would start "flashing" at about the 18-foot level, so as to reduce its temperature to the point dictated by the pressure. Result is loss of capacity because of a "starved" expansion valve.

To combat this situation, the liquid should have entered the vertical line with at least 10° of subcooling. If full capacity operation forbade overcharging the condenser with refrigerant, other provisions should have been made.

Liquid-suction heat exchangers are especially suitable for low-temperature systems. For operation at air-conditioning temperatures, the addition of a small shell-and-tube liquid subcooler in series with the main



NIBCO WROT Fittings are formed in one step from straight copper tubing. They are strong, light in weight and dense in structure . . . impervious to gases. Because every fitting is perfectly formed and absolutely "round and square," they are easier to use in production. Laboratory Control and individual plug testing assure close tolerances. You can eliminate service troubles by using vibration-proof and corrosion-proof NIBCO WROT Fittings. Write for complete catalog.



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VALVES AND FITTINGS SINCE 1904



REFRIGERATED soda fountains are being installed in most of the newer units of a Pacific Coast super-market chain.

In addition to proving profitable revenue producers, the new departments are a convenience to patrons. Get the idea?

condenser may be economically more justified.

Choice of the method to effect subcooling will depend on condensing water and saturated discharge temperatures, and actual suction gas temperatures. The cost of the subcooling device in its relation to the cost of the complete system will also be a factor.

Non-Condensables

The presence of air or other non-condensables in the system has not been mentioned. Good service engineers check the reasons for high head pressure, aware that good will can be built by reducing power or water bills. If air is suspected, the machine should be stopped, and the condenser allowed to reach a known temperature.

On an air-cooled machine, the belts are disengaged and the motor started, which will bring the condenser to room temperature in about five minutes. On a water-cooled condensing unit, the water valve is opened, and when inlet and exit water are at the same temperature, the liquid refrigerant in the condenser may be assumed to be at this temperature also.

The temperature-pressure chart of the refrigerant in use is then referred to (See Graph No. 2) and the con-

denser purged from a high point until the pressure agrees with the water temperature. Since, for the common refrigerants, one p.s.i. pressure difference is only a fraction of a degree, there is no great error to affect subcooling calculations if all the air cannot be purged, as is often the case.

Summary

In summary, subcooling knowledge will be useful in

1. *Increasing system capacity.* Ten degrees of subcooling increases refrigerating effect 6 per cent for Freon-12 and 4 per cent for Methyl Chloride.

2. *Increasing condenser capacity.* Five degrees of subcooling at the expansion valve insures proper operation of same. More may mean an overloaded condenser.

3. *Predicting the state of the refrigerant at remotely located expansion or float valves.*

4. *Quickly checking a suspected refrigerant shortage.*

LOCKER PLANT . . .

Continued from page 31

by mail, primarily because of the difficulty of finding people at home, and also to get away from any possible objections tenants might have to being personally solicited regarding the service. Not all the lockers were rented before the installation went in, but users' endorsements to their neighbors resulted in 100% rentals in a relatively short time.

As Mr. Wheeler sees it, this is not the sort of a business in which any refrigeration dealer or distributor can—or would even want to—engage. One good-sized operator, he feels, is all there is room for in each large metropolitan center. And in small centers of population there is little possibility for this type of operation, except as perhaps an extension of an established frozen food distribution set-up.

Installation of the enclosure in which the lockers are located is relatively inexpensive, an important factor in enabling the installer to "come out" on the investment within a reasonable time. The enclosure is made in section and bolted together, after assembly inside the apartment building. The original unit is powered by a 1 H.P. condensing unit, mounted on top of the enclosure.

The integration of locker and de-

livery services has some definite advantages for both apartment tenants and frozen foods vendors, Mr. Wheeler declares.

No Shopping Problem

It eliminates a major shopping problem, important because often both husband and wife work and are out of the dwelling most of the day. Even if the wife is at home, space for a separate low temperature cabinet often is lacking in the apartment itself, so that substantial amounts of

frozen foods cannot readily be used. A locker in the apartment basement solves both these problems.

The arrangement is desirable from the standpoint of the frozen foods distributor because it provides him with a substantial volume of business in one easy-to-handle delivery operation every two weeks. With cooked and baked frozen foods becoming more available, practically all the food requirements of the tenant-renter could be brought to his locker by the frozen foods distributor.



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voltage before condemning either one. If voltage is O.K. and relay still fails to drop, although the pump is running, the compressor will have to be reoperated. Usually the solder on the ends of the rotor has washed away, and unless you are well equipped for this type of work, ship the entire compressor to the factory for repairs.

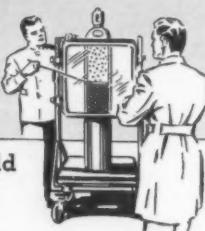
Naturally, if the compressor is stuck, the relay will not drop and need not be checked with another relay. Unless the impedance of the rotor is very high, the compressor will run when the relay is pushed down by hand. However, the same trouble will occur on the next cycle.

On Models "C", "D", "M", and "R", a transformer is used with the condenser for starting to increase the voltage across the condenser and thereby increase the capacity. On

Models "J", "K", and "M", only a 80 M.F.D. condenser and relay is used in the starting box. This condenser is subject to loss of capacity, etc., and it is a good policy to carry one of these condensers in stock. The value of the condenser in M.F.D.'s must be held very close, so that the relay will operate correctly. For this reason, use only an 80 M.F.D. condenser as manufactured by reputable concerns. On all electrical trouble, be sure to check line voltage. Due to the heavy demand of war industries in existing power installations, many cases of low voltage have come to light on service calls. A good voltmeter-wattmeter combination is something every service man should have.

Service Engineers Should Know . . .

Why: Refrigerant cylinders should never be filled beyond their specific rated capacity.



1. Cylinders of the same water capacity have a different maximum filling capacity for each refrigerant. For instance, a cylinder with a maximum capacity of 5 lb. of SO₂ must not contain more than 3½ lb. of Methyl Chloride. X-Rayed, a properly filled cylinder looks something like this:



3. If too much refrigerant is put into the cylinder, the liquid expanding under heat may fill the cylinder completely, causing powerful and dangerous hydrostatic pressures.



2. The liquid must not completely fill the container when heated to 130° F. The liquid refrigerant will expand about 11% in volume during a temperature rise from 40° to 130° F.



4. This is what happens when the hydrostatic pressure can no longer be contained — the cylinder explodes violently. Never overfill cylinders; it is dangerous!

Here is a simple illustration of what happens from overfilling. A thermometer works perfectly until the mercury, expanding from heat, hits the top of the tube. And then, pouf! Play safe — don't overfill cylinders!



Manufacturers of
"Virginia" Refrigerants and Agents
for Kinetic's "Freon-12" —
"Freon-22" — "Freon-11"



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MODELS "H" AND "K" UNITS

All service troubles previously mentioned will apply to Models "H" and "K". These two models had an air duct arrangement which made it necessary to clean the condenser with a long handled brush from beneath the box. In most cases, the customer either neglects to clean it, or, due to the fact that you can not see if it is clean, the condenser is blocked solid. Probably the surest way to clean them thoroughly is to remove the board, dismantle the condenser, and blow out with methyl. This cleaning, aided by a little help from the owner, should be sufficient for four or five years.

The outlet tube of the "H" and "K" condenser is $\frac{3}{16}$ " tubing, and over a period of time, deposits of carbon, drying agents, etc., may block the line at this point. Most condenser restrictions can be blown out on the job, but in persistent cases, replace the $\frac{3}{16}$ " tube by sawing off a portion of the elbow, swedging out to $\frac{1}{4}$ " and silver soldering 16 inches of $\frac{1}{4}$ " tubing in its place.

MODEL "J" UNITS

Model "J" units are the only package unit of the line. It is a top-mounted unit and was used only on small 4- or 5-cubic foot boxes. The compressor used in this model is similar to the model "K". In an emergency, the dome can be unbolted and shifted and interchanged. The internal parts and capacity are the same. All service complaints will apply to this model as well. Do not remove the dividing panel in the machine compartment; the machine will overheat.

Since this is only a one-pass condenser, make sure it is absolutely clean and that the fan is running at full speed before leaving any service call.

MODEL "W" UNITS

Up to 1937, all Grunows came equipped with two-button controls. In 1937, a one-button control was used with a bimetallic overload mechanism in the service cord. Before condemning a control, make sure the overload mechanism is O.K.

Model "W" pumps are mounted on these rubber mountings, and with an improved interior design to prevent vibration. This machine ran very



Typical Grunow Carrene meter (left) and float valve assembly.

quietly and was the best one of the line. All service operations will be the same as on previous models, with the exception of the control, since the overload is in the service cord, as previously stated.

Models "M," "R," and "W" models have a removal machine compartment door in the front of the cabinet which forms a part of the air duct. The owner can easily clean the condenser with this arrangement, and since the condenser fin spacing is wider, very little trouble is encountered from plugged condensers.

In conclusion, we would again advise that unless your shop facilities are adequate, the best policy to follow on compressors is to return them to the factory. All other work on Grunows can be accomplished with little special equipment and still give the customer the break he deserves.

DETROLA SELLS ITS INDIANAPOLIS PLANT

International Detrola Corp. has sold its Indianapolis machine tool plant and equipment. Production and servicing of Libby turret lathes has been transferred to the company's Elkhart, Ind. plant. The Indianapolis land and buildings were purchased by F. L. Jacobs Co., Detroit.

FROZEN FOODS TO BE HOME DELIVERED

The first distribution company to offer door-to-door deliveries of frozen foods in the Cleveland area has been organized by E. B. Odenkirk, president of Red Robin Frozen Foods.

The new company will soon market frozen coffee in the Cleveland area, and by next spring a complete line of frozen foods will be available for daily home delivery, Mr. Odenkirk declared. He said that his company will install low temperature units in homes.

CANADIAN PRODUCER FOR CLEAN-A-COIL NAMED

Delta Engineering Ltd., Montreal, has taken over sales and manufacturing rights in Canada for Clean-A-Coil solvent, under an agreement with Standard Solvent Co., Chicago, reports George E. Wilder of Standard Solvent. Production has been started by Delta Engineering in its plant at Montreal and Welland. Letters patent for Canada under U.S. Patent No. 2089317 are under joint application by the two companies.



That quickly restores to operation any HERMETIC FRIGIDAIRE, GIBSON, GRUNOW, NORGE, COLDSPOT, GENERAL ELECTRIC, AND OTHER UNITS REQUIRING EITHER SPLIT PHASE OR CAPACITOR STARTING CIRCUITS.

*these exclusive
and ingenious
features:*



Patent Pending

1. Quickly starts and tests HERMETIC and OPEN type units.
2. Flexible enclosed switching, creates special starting circuits for any type motor up to $\frac{1}{3}$ HP.
3. Unique combinations necessary to correct defects in hard starting units, may be supplied later for permanent repair.
4. Circuit continuity and high voltage neon tube leakage tester.
5. Eliminates unwarranted tampering with sealed units.
6. Scientifically designed for easy operation.
7. Impressive looking and creates customer confidence.

Complete with power cord, test leads
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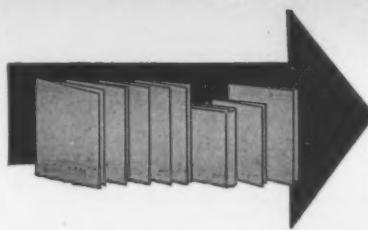
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• Back on a peace basis once more! That means the AeroVox line of motor-starting capacitors once again includes the widest selection of both exact-duplicates and those universal types that served so well during the war shortage. You can now get replacements exactly matching the units you're replacing — even to such details as the insulating jacket, as here shown. Yes, be sure to make it AEROVox for those replacements—and you'll be getting just the right types for the right jobs.

• Ask Your Jobber . . .

Ask him for AEROVox motor-starting capacitors. He either has them or can get them for you. Ask for the latest AeroVox Catalog. Or write us direct.



Useful Literature

The publications listed below are available to readers without charge. Simply list in the coupon at the bottom of this page the numbers of the items you wish to receive, and send it to THE REFRIGERATION INDUSTRY, 812 Huron Road, Cleveland 15, Ohio. Your requests will then be forwarded directly to the companies concerned.

226—Industrial Water Coolers . . . a four-page folder, issued by Buildice Co., Inc., listing design features and other information on its line of commercial and industrial water cooling equipment. Capacities and general dimensions of available units are included in the folder.

227—Central Heating-Cooling Installation . . . a 24-page book, issued by the Ric-Wil Co., discussing the economics of supplying heating, cooling and other services to a planned housing project from a central source. Book gives detailed factual analysis of the subject, with blueprints, cost tables, etc.

228—Hand-Cleaning Compound . . . a four-page folder describing the properties of Den-Nex, a hand-cleaning compound designed to remove lacquer, paint, and other materials from mechanics' hands. The material may be available from parts and supply jobbers.

229—Blower Units . . . Dimensions and performance data on the new line of blower units recently developed and marketed by Lau Blower Co.

230—Filter Cleaning Material . . . Literature describing the newly developed process of cleaning air conditioning filters chemically using Turco "Aktiv" compound. Available from Turco Products, Inc.

231—Farm and Home Freezers . . . Additional information and literature describing the new "Harderfreez" upright farm and home locker just announced by Tyler Fixture Corp.

232—De-Scaling Compound . . . A four-page folder describing "Nu-Coil" re-

frigerator coil cleaner compound, available from Skasol Corp.

233—Pipe Sealing Compound . . . A one-page circular, available from Bowser, Inc., listing and describing the new "Black Magic" pipe sealing compound which it has developed for use with gasoline, oil and other petroleum base solvents.

234—Cellular Rubber . . . A four-page pamphlet (845-21) describing various forms in which sponge rubber, bonded fiber and other sub-density materials are manufactured. Illustrates 98 shapes of rubber products used for cushioning, shock absorption, vibration dampening, gasketing, etc. Issued by Sponge Rubber Products Co.

235—Insulation . . . Literature describing the properties and illustrating features and usages of Gold Bond Zerocel rock wool insulation. Available from industrial division, National Gypsum Co.

236—Solenoid Valves . . . A bulletin, available from Alco Valve Co., covering the line of solenoid valves which the company has available for refrigeration applications.

237—Suction Pressure Valves . . . Illustrated bulletin and other information on its Model 235 suction pressure valve, and on other refrigerant valves in its products line. Available from Automatic Products Co.

238—Vibration Test Equipment . . . A bulletin, issued by L. A. B. Corp., illustrating and describing the vibration test stands and tables for plant laboratory and production uses which it has developed.

MAIL THIS COUPON FOR FREE LITERATURE

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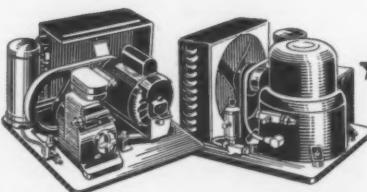
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Increased facilities
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fundamentals applied so success-
fully by Kelvinator in the house-
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Production is now confined to
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BUY KELVINATOR FOR YOUR COMMERCIAL REFRIGERATION REQUIREMENTS

Kelvinator CONDENSING UNITS
OPEN AND SEALED



ABOUT PEOPLE . . .
Continued from page 32

with Westinghouse Electric Corp., is a charter member of the Baltimore-Washington section, and a past president of the Electric Institute of Washington.

William D. Meagher has been named factory superintendent and **Carl C. Whitcomb** design and development engineer for Schlem Brothers, Inc., East Peoria, Ill., low temperature cabinet and air conditioning equipment manufacturer. Mr. Meagher formerly was with Operadio Mfg. Co., St. Charles, Ill., and Mr. Whitcomb with Commercial Solvents Corp., Peoria.

Capt. Ralph E. Lee, recently discharged from the Army Air Corps, is now manager of the export department of the Trane Co., La Crosse, Wis.

A. B. Schad has been elected president of the Electrical League of Richmond (Va.) for the coming year.

Charles Davies, New York City industrial designer, is being retained as consultant on styling and product engineering for United States Air

Conditioning Corp., Minneapolis. Mr. Davies was at one time president of the Davies Air Filter Corp.

M. Parcaro has been appointed executive general manager of American Coils Co., announces T. W. Binder, president. Making his headquarters at the American Coils main office and factory in Newark. Mr. Parcaro will spend much of his time

in the field conferring with makers and users of air conditioning and refrigeration equipment.

After 14 years in Carrier Corp's research and design sections, Mr. Parcaro joined Penn Electric Switch Co. as New York regional manager. He is vice-chairman of the Northern New Jersey section of A.S.R.E.

The appointments of **Clayton P. Dunning** as manager of the newly-organized New York appliance sales district of General Electric Co. and of **Carleton A. Reeves** as manager of the company's northeastern appliance sales district, Boston, have been announced by C. R. Pritchard, general sales manager of G-E's Ap-

pliance & Merchandise Department.

Mr. Dunning since 1942 has been in Washington as liaison between the War Production Board and General Electric.

Mr. Reeves was named to succeed Lieut. Col. James A. Ramsey, who died Sept. 24. Since January, 1945, he has been acting manager of the northeastern district.

F. M. Mitchell, formerly director of the Consumers Durable Goods Division, War Production Board, Washington, D. C., has returned to Frigidaire Division, General Motors Corp., in the capacity of manager of laundry equipment sales. Mr. Mitchell was advertising and sales promotion manager of the Frigidaire district in Roanoke, Va., from 1938 to the time of his entering federal service in 1941.

D. C. McCoy has been delegated to handle Frigidaire's home freezer sales. Mr. McCoy

is said to be one of the foremost authorities in the country on the subject of frozen foods and low temperature refrigeration. In his 20-year association with Frigidaire, he has been engaged as sales engineer, specializing in ice cream cabinet sales; zone manager, covering both appliance and commercial sales; and has been the manager of the commercial section of Frigidaire's product development and application department.

During the past three years, he has devoted most of his time and effort to Frigidaire's frozen food research program.

Paul W. Kohler has been appointed advertising and sales promotion manager of the East Springfield (Mass.) plant of the Westinghouse Electric Appliance Division. Mr. Kohler has been with Westinghouse since 1935, and since last year has been assistant to the advertising and sales promotion manager, working on the company's "War Production Bulletin."

Kenneth Stark has joined Salem Engineering Co. as sales supervisor. Formerly sales manager of Dairy In-

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ICE-X

Eliminates FREEZE-UPS

ICE-X quickly cures emergency freeze ups when ice forms at the expansion valve or capillary tube. Harmless to use. Great for Freon, Carrene, or Methyl Chloride systems . . . The dependable liquid anti-freeze.

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EXCLUSIVE NATIONAL DISTRIBUTOR

THE HARRY ALTER CO. 1728 S. MICHIGAN AVE.
CHICAGO 16, ILLINOIS.

JOBBERS: WRITE FOR SPECIAL PROPOSITION!

dustries, Inc., Des Moines, he will promote the use of frozen food locker plants, commercial freeze, and commercial cold storage for Salem. Mr. Stark will be located at the Salem Engineering Co. office in Salem, Ohio.

L. A. Iermann has been appointed manager of sales for the Cincinnati Appliance Distributing Branch of General Electric Co.

Ross R. Smith, president of Iceberg Refrigerated Locker Systems, Inc.,



announces the appointment of **Sam C. Mitchell** as general sales manager, with headquarters in the Empire State Building, New York.

Mr. Mitchell has previously been sales and promotion manager of Hamilton Radio Corp., director of sales promotion and advertising of Kelvinator Corp., and western sales manager of Crosley Corp.

Willard B. Winslow, vice-president and general manager of Baker Ice Machine Co., has announced the appointment of **Sterling F. Smith** as general sales manager. Mr. Smith will be responsible for all sales of the Baker Co., whose manufacturing facilities and general offices are located in Omaha, Neb.

Sales activities are conducted through a nation-wide distributor organization with branch offices of the parent company in Los Angeles and Seattle. Baker foreign distributors are established in 63 countries.

Before becoming associated with Baker, Mr. Smith was with Mills Industries, Chicago, as manager of that company's refrigeration division, and prior to that time was chief of the refrigeration and air conditioning section of the War Production Board.

R. C. Cosgrove, vice president and general manager, manufacturing division, Crosley Corp., which was recently purchased by the Aviation Corp., has been named vice president in charge of sales for The Aviation Corp.

AVCO manufacturing units in-

clude the Lycoming Division, Williamsport, Pa.; Republic Aircraft Products Division, Detroit; and Spencer Heating Division, Williamsport. American Propeller Corp. Toledo, is a wholly-owned subsidiary.

Mr. Cosgrove, in addition to his new duties, will continue as vice president and director of Crosley Corp., and general manager of its manufacturing division, where he has been active in the radio, refrigerator, and major household appliance field.

John G. Waddell has been named

managing director of the recently organized Electric Institute of Boston. Most recently he was with the Radio and Radar division of W.P.B. Before the war he headed the General Equipment Co. of Boston, and previously had been with Westinghouse and G-E.

R. J. Schumann has been appointed plant manager of the Airtemp Indianapolis plant. Mr. Schumann has been chief estimator and supervisor of time study since September, 1942.

ECONOMICAL TO USE!

10
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THAWZONE
Fully Protected by U. S. Patent
THE PIONEER FLUID DEHYDRANT

... for each pound of refrigerant in the system. And no dilution-of-refrigerant worries.

Removes Moisture Chemically

A TINY AMOUNT ...
A BIG JOB ...
SMALL COST

POSITIVE, PROFITABLE PROTECTION!

Add It to Every
Refrigeration System

The smart refrigeration engineer puts TRACE in every unit he installs or services, and warns the customer to phone immediately if "bleeding" appears.

This protective measure insures prompt service at minimum cost for repairs and spoilage, and builds customer-confidence in the engineer. Add TRACE to every system.

TRACE
REFRIGERANT
LEAK DETECTOR



TRADE PRICES	4 oz. bottle.....\$1.00	1 pint bottle.....\$3.00
(Save 10% on case lots)	(48 bottles to a case)	(24 bottles to a case)
	8 oz. bottle.....\$1.75	1 quart container.....\$5.00
	(24 bottles to a case)	(12 containers to a case)

1 gallon container (6 containers to a case).....\$16.00

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HIGHSIDE CHEMICALS CO.

195 VERONA AVE.

NEWARK 4, N. J.

All-Industry Show, the National Frozen Food Locker Association, the Frozen Food Locker Manufacturers & Suppliers Association, which sponsors the Locker Show, and the Farm and Home Freezer Manufacturers Association.

All these groups, plus Refrigeration Service Engineers Society and National Refrigeration Supply Jobbers Association, may schedule meetings during the Show period in Cleveland.

The Locker Association also is planning a number of regional meetings next spring, with some equipment displays probably included. Tentatively listed as sites for the meetings are Atlanta, Dallas, Minneapolis and San Francisco, in April and May of next year.

It's REWA Now. Directors of National Refrigeration Supply Jobbers Association have officially approved a change in the name of the organization to Refrigeration Equipment Wholesalers Association. The new name, it is believed, more nearly describes the wider range of activities in which member companies are now engaged.

One-Price Policy. Prices on refrigerators and ranges and a new national one-price policy have been announced by General Electric Co.

Prices on the two refrigerator models now in production are set at \$151.50 and \$188.25. A third type will

be on the market before long at a price of \$133.75.

The national one-price policy will equalize the freight rates to different sections of the country. Instead of shipping products F.O.B. the place of manufacture, they will be shipped F.O.B. from the distributor.

Frigidaire Pricing Plan. In connection with the release of the first postwar household models to distributors and dealers, Frigidaire announced that it is putting into effect a national pricing plan which, exclusive of excise and local taxes, sets a retail cash installed price for each model that is the same throughout the United States. Under this plan all carload freight charges from factory to distributors and dealers, and all l.c.l. freight charges from distributors to dealers outside warehouse-city metropolitan centers served by a common carrier, will be paid by the factory.

This plan replaces the zone plan under which Frigidaire has operated for a number of years past. Under that plan, prices varied with the zone in which the dealer was located and the distance the dealer was from the zone distribution point.

Hotpoint Prices. A standard 7-foot Hotpoint refrigerator at \$188; and the lowest priced model at \$151.50, both prices complete, delivered to consumers in any part of the nation, have been announced as approved by OPA, by Edison General Electric Appliance Co.

Prices are approximately the same as 1942 prices for these models, says Floyd M. Slasor, manager of the refrigeration sales division.



*Write for Literature
or
Call your Local Jobber*

COIL CLEANER

for
Water Cooled Equipment

SAFE

No Rubber Gloves Necessary

ECONOMICAL

Can be reused many times
or diluted when necessary

PRACTICAL

Releases stuck compressors
Quickly . . . Fast Action
on water scale

SKASOL CORPORATION

Webster Groves 19, Missouri

Why the Trend Is Strong to CHICAGO SEALS and VALVE PLATES



Chicago Seals and Valve Plates make a better servicing job on all refrigerators, in less time, at less cost, at more profit . . . and more service men and more jobbers are finding out this fact every day.

CHICAGO SEAL CO.
20 North Wacker Drive, Chicago 6, Ill.

PORATBLE COOLER FOR ARMY MEDICAL CORPS USE

Development of a portable all-purpose, medical refrigerator for the storage of whole blood, biologicals, and perishable foods and drugs for use of the Army Medical Corps has been announced by Brigadier General J. E. Barzynski, commanding general of the Chicago Quartermaster Depot.

The unit was designed by the Quartermaster Corps in cooperation with General Electric Co.

Made of aluminum throughout, the refrigerator is extremely lightweight, weighing only 175 pounds complete. Its outside dimensions are 33 by 24 by 38 inches and it can be readily carried by two men using the handles provided on either side.

Two different temperatures are maintained in two separate compartments of the refrigerator. One compartment contains five removable aluminum baskets which have a net usable capacity of 2½ cu. ft. These baskets may be used for storing 48 bottles of whole blood which must be kept between the limits of 35° and 50° F.

There is also a center compartment which contains a removable tank, used for storing vaccines which will maintain a temperature of about 15° F. This tank has hollow walls filled with a eutectic fluid permitting the tank to be removed from the refrigerator during defrosting while maintaining an inside temperature of below 25° F. for an hour or more, it is said.

The hold-over feature also permits taking the tank to points some distance away from the refrigerator for the administration of vaccines without danger of their spoiling.



FIRST CROSLEY—Frank A. Schotters (left) Crosley production vice president, congratulates John W. Craig (right) works manager of the Richmond, Ind., plant, on the first new Crosley unit to be produced. In center is Lee Stratton, refrigerator sales manager.

ARMSTRONG CORK STARTS VET RE-TRAINING PROGRAM

With the return of the first four of its 50 salesmen who entered the armed forces, the building materials division of the Armstrong Cork Co. has started its program of re-training the veterans to resume their careers with the company.

The four who have returned are H. H. Gates, A. C. Alloway, Frank D. Schwarz and F. D. Rupprecht. All will handle industrial products, specializing in the insulation field.

Each returning veteran is receiving intensive refresher training to acquaint him with the war-time progress made in the fields in which the building materials division is active, and to bring him up to date on the changes that have taken place in the company during the war. The training period runs about three weeks, depending upon the length of time the individual had been with Armstrong Cork prior to his military leave, and upon the type of products he will handle.

It Costs Less

TO MAINTAIN

The DFN System

Inexpensive Cartridges

Faster Servicing

Make The Difference



DFN Cartridges are inexpensive because they are made for replaceable service and are protected by inserting in a heavy shell. When the DFN drier assembly is ready for a change, you merely open the flange and replace the low-cost DFN Cartridge. The DFN Shell STAYS ON for repeated use. Each cartridge change multiplies your savings in assembly time and parts.

The DFN System also saves you money because it provides complete, triple action against costly freeze-ups, clogging and corrosion! Each DFN Cartridge is a complete unit. Mechanically-packed, dust-free drying agent is hermetically sealed to give full-strength dehydration and neutralization. No danger of loose packing to cause by-passing of refrigerant. Exclusive DFN anti-sediment assembly filters to minute size. Holds more sediment and sludge without pressure drop.

Ask your distributor or write us for Catalog R-7.

WIRE MESH PRODUCTS
Monel Brass Bronze
Refrigerant, Oil and Other Liquid Gases
Fabricated to Specification

McINTIRE CONNECTOR CO.

NEWARK 5, N. J.

Only the

DEHYDRATORS • STRAINERS



DEHYDRATES
FILTERS
NEUTRALIZES

FILTERS • NEUTRALIZERS

2 BIG HELPS



... to **4 BIG BENEFITS**

FAMOUS Texaco Capella Oils, for every type of refrigeration and air conditioning equipment — plus the helpful Texaco Lubrication Guide that tells you how and where to use them — are 2 big helps to: (1) Increased Sales, (2) Bigger Profits, (3) Greater Customer Satisfaction and (4) More Repeat Business. Here's why —

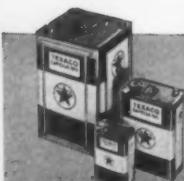
You can't buy a finer compressor oil than *Capella* — and you have a complete line to meet manufacturers' lubrication requirements for all air conditioning and refrigeration equipment. *Texaco Capella Oils* are dehydrated and highly stable. They do not react with refrigerants, and virtually eliminate gumming and sludging. All have exceptionally low pour points.

Texaco Capella Oils are used, recommended

or approved by leading manufacturers. Actual service, over many years, has demonstrated their ability to assure smooth, trouble-free compressor operation. They come in *re-sealable* containers — convenient 1-qt., 1-gal. and 5-gal. cans — that assure protection, are handy to use, and make attractive, sales-building displays.

The Texaco Lubrication Guide lists make and type of compressor and refrigerant used in each of 55 electric refrigeration units and 32 air conditioning units, and shows which oil to use for each. Copies of this valuable servicing aid are free upon request.

Order Texaco *Capella* Oils now from the nearest of more than 2300 Texaco distributing plants in the 48 States. The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO Capella Oils

FOR ALL AIR CONDITIONING AND REFRIGERATION EQUIPMENT



TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON SUNDAY NIGHTS ★ METROPOLITAN OPERA BROADCASTS SATURDAY AFTERNOONS

and the entire crew had to be trained for their jobs.

The company was fortunate to obtain the services of Dr. E. F. Jameson, a veterinarian, with years of experience in slaughtering and meat inspection. He was placed in charge of the operation and maintained a high level of sanitation. Inspection and grading were carried on through regular government channels.

During the month of August, the cold storage plant received 223,004 pounds (chilled weight) of beef and issued 248,122 pounds to cafeterias and concessionaires. More than 210,000 pounds of perishable merchandise were stored for Oak Ridge meat markets, canteens, restaurants and the Oak Ridge Recreation and Welfare Association.

Mr. Ochsner says that he has always tried to keep the operating cost of the plant as low as possible. "Just the same," he says, "I was relieved when I found out what was being produced at Oak Ridge. I knew then that any money expended for the cold storage plant was worth while."

AMINCO OIL SEPARATORS



Aminco Oil Separators protect compressors by maintaining correct oil level in crankcase and by excluding oil from refrigerant stream they enable coils, condensers, valves and dehydrators to function most efficiently.

These oil separators are made for jobs from $\frac{1}{2}$ H.P. to 120 tons and are used everywhere, ashore or afloat, where efficient refrigeration is desired.

Full descriptive bulletins on request.

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THE PRACTICAL Refrigeration Engineering MANUAL . . . by Harold Smith

X. Apple Storage

PART III

AS THE total heat leak and service load has already been figured at 6500 B.T.U. per hour, and the products load figured at 11,063 B.T.U. per hour, there would be a total hourly load of 17,563 B.T.U. This figure would represent the hourly load required during the initial cooling down of the product over an eight-day period.

After the product has once been cooled, the load is considerably reduced, as it is then represented only by the heat leak and service load plus the continued load of respiration heat. At a temperature of 35°F. respiration heat would figure approximately 1200 B.T.U. per ton in 24 hours, or 50 B.T.U. per ton per hour.

As the load would represent 50 tons, the hourly B.T.U. load for respiration heat would be 2500 B.T.U. so once the product is cooled down to the storage temperature of 35°F. the hourly load is reduced from 17563 B.T.U. to 8700 B.T.U., or approximately one-half of the initial cooling.

USE TWO COMPRESSORS

Because of this fact, it is usually desirable to figure an apple storage refrigeration installation on the basis of using two compressors of equal size, and, where the cooler is over 10 feet long and 10 feet wide, using two forced-draft convention units with each condensing unit, or four units in the cooler. Where the cooler is small, under 10x10, one cooling unit to each condensing unit is sufficient in most instances.

By using two condensing units and four evaporators, two to each unit, one condensing unit and two evaporators can be shut down after the original cooling has been done. With this thought

in mind, it is well to distribute the four units in such a way that each condensing unit will handle an evaporator at each end of the cooler to assure uniform temperatures, either operating one condensing unit or the two.

With the example we have used, the load for eight days represents 17,563 B.T.U., and would indicate that the use of two one-horsepower air-cooled compressors, either methyl or Freon, with approximate capacity of 20,000 B.T.U., should adequately handle the installation. When the initial cooling has been completed, the one entire unit can be shut off until such time as additional products are added to the cooler, so that the holding load can be handled with only one unit.

UNIT COOLER LAYOUT

On an installation of this type, four forced-draft unit coolers are recommended, each with a capacity of 4500 B.T.U. at a 10° T.D., giving a total of 18,000 B.T.U. capacity. When two of these units are cut out of operation, along with one condensing unit, there still remain two units with a capacity of 9,000 B.T.U. per hour, which is entirely adequate to handle the permanent storage load.

These units should be figured on a basis of 30°F. air and 20°F. refrigerant or 10°F. temperature difference. If further stocking up of the cooler is done at a later date, the second unit can be put back in operation to again handle the initial cooling load.

In making an installation of this type, it is well to install two room thermostats in the cooler, each connected to solenoid valves which are placed in the liquid line of each condensing unit. One of these thermostats may be set to cut off at a temperature of

GOLDBERG PARTY SET FOR DECEMBER 13

Herman Goldberg's ninth annual Christmas Party, which has grown into something of an industry fixture, will be held in the Main Ballroom and Walton Rooms of the Drake Hotel, Chicago, on Thursday evening, Dec. 13. Arrangements have been made to take care of 1200 guests.

As usual, the party will be complete with entertainment, music and refreshments, plus "added innovations

which were impossible to obtain during the war period." Mr. Goldberg advises out-of-towners to make their Chicago hotel reservations well in advance.

DISTRIBUTOR EXPANDS

Bergman Norge Co., of Buffalo, distributor for Norge appliances in the western New York and northern Pennsylvania area, has acquired a new building at 94-96 Elm St. to house its showrooms, offices and parts department.

36°F. and the other set to cut off at 31°F.

By making a hook-up of this type, when the initial heat load is removed from the product, the unit controlled by the thermostat set at 36°F. will automatically cut off when the temperature reaches that figure, and the contacts break in the thermostat closing the solenoid valve and in turn shutting off the liquid from the evaporator. This will quickly make the machine pump down and allow it to remain out of operation until such time as the temperature in the room rises above the 36°F. point, at which time the machine will again go into operation.

TO AID CIRCULATION

In some instances it is desirable to allow the fans to continue in operation on the evaporators after the condensing unit has cut off, as this aids in the circulation or air throughout the cooler.

In placing the evaporators in the cooler, it is usually considered good practice to place one on each wall and at opposite ends of the cooler, connected to one condensing unit. In this way there will always be cooling at both ends of the cooler, and air brought in from opposite directions to insure continued circulation.

In many proposed installations there will, of course, be cases where the coolers have little or no insulation, and wherever possible it is advisable to attempt to sell the customer on the advantages of insulation as, without doubt, the cost of the equipment and the initial investment will be considerably lower where good and adequate insulation is used.

One advantage usually found in apple storage cooling is that the plant is in operation during the cooler part of the year, usually being started late in September or early in October and remaining in operation until the products are sold, which usually

runs into the middle of February or March. Because of this fact, the refrigeration loads are relatively light, as the outside temperatures are low, and there is comparatively little heat transfer through the walls of the cooler.

It is very important for the refrigeration contractor to talk with the customer and secure a clear picture of the way the cooler is loaded, just about how many days it takes to load the cooler, and all the facts pertaining to the handling of apples, such as the type of crate or basket used and the average temperature of the apples at the time storage takes place, in order to give a successful estimate of the refrigeration load requirements.

Usually the condensing units are installed just outside the cooler where there is an additional room available for the installation. However, where this is not available, the compressor can be installed in a loft above the cooler, or built into a room or house of some kind.

AIR-COOLED UNITS

It is definitely advisable, in most instances, to consider only air-cooled type machines, as water is usually at a premium on the farm. There is also constant danger of freezing up when water is used during the cold weather.

On many installations it may also be advisable to put speed controls on fan units, which will enable the operator to run his fans either at high or low speed, as conditions demand.

If it becomes necessary to place the condensing unit above the storage room, it is advisable to use oil separators on condensing units to avoid the possibility of excessive loss of oil from the crank case of the condensing units. Heat exchangers may also be used to good advantage where the installation calls for close control and complete equipment application.

BOOKLET ISSUED ON APPRENTICE TRAINING

In reply to inquiries from men in service for information on apprenticeship, a comprehensive booklet on the subject has been prepared for their guidance by Apprentice-Training Service, U. S. Department of Labor. This booklet, entitled "Apprentice Training for Returning Servicemen," has been written in collaboration with representatives of the educational branches of the War and Navy Departments, and the Veterans Administration.

While the booklet is designed primarily for men still in the services, it is of equal value to those already released from service, and also to employers and labor organizations, especially in gaining a clear understanding of the veterans legislation as applied to ex-servicemen who are employed as apprentices.

Included in the information contained in this booklet is an explanation of the financial benefits of the veterans legislation which supplement apprentice wages, qualifications required of veterans for these benefits, as well as for apprentice training, procedure to follow, application forms and experience records needed.

Copies of this booklet may be obtained by writing to Apprentice-Training Service, U. S. Department of Labor, 1778 Pennsylvania Ave. N. W., Washington 25, D. C.

THE WATCHDOG
OF THE NATION'S
FOOD SUPPLY

Refrigeration
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Coils for Refrigeration
Coils for Air Conditioning
Air Conditioning Units
Humi-Temp Forced Convection Units
Polished Aluminum Disseminator
Pans
Steel Plate Coils
Evaporative Condensers
Industrial Coolers
Water Coolers

LARKIN COILS

519 Memorial Dr., S. E.
ATLANTA, GA.

THE REFRIGERATION INDUSTRY

WORK REQUESTED								
Wet car too Ball Fach dry premises work 12/14/44								
ITEM	UNIT							
MADE	WEIGHT							
MODEL	25 AM							
TYPE	AP							
SERIAL	27054							
YEAR	1934							
BELT	2							
QUAN.	ITEM	AMOUNT						
3#	Methyl chloride	N/C						
MATERIALS TOTAL		1.00						
SERVICE ENGINEER	HOURS							
Henry	2	N/C						
LABOR TOTAL		6.00 N/C						
MILEAGE 47c 258 TOTAL CHARGES N/C								
TIME RECORD								
DATE	START	STOP	TOTAL	DATE	START	STOP	TOTAL	
12/15/44	10:00	12:00	2					
OTHER CHARGES								
REQUEST	✓	✓	✓	✓	✓	✓	✓	✓
PROMISE	✓	✓	✓	✓	✓	✓	✓	✓
STARTED	✓	✓	✓	✓	✓	✓	✓	✓
COMPLETION	✓	✓	✓	✓	✓	✓	✓	✓
DELIVERY	✓	✓	✓	✓	✓	✓	✓	✓
SM. 4-42 RECD.								

John Doe
222 X St.
Same

DATE Feb. 15, 1945

Reopened leaky float on
suction line connection
to compressor not
customer's fault

Added sufficient refrigerant
for correct operation

MILEAGE 47c
258 TOTAL CHARGES N/C

John Doe
W. Henry
SERVICE ENGINEER

Here's a Service Order Form That Does Double Duty

Editor:

In reading the article by Fred Merish, "Sell Your Service at a Profit," in one recent issue, it occurred to me that the Service Order Form I have developed (after years of reworking them) does the double duty of recording the work to bill the customer as well as to keep track of costs.

I am enclosing one of these forms, which is more or less self-explanatory. Work requested, data on equipment, record of conditions found and corrections made, detailed record of material and labor, time on the job, etc. are well taken care of. On the copy filed in our office, cost records can be kept as shown in the figures behind Materials Total, Labor Totals, under Mileage and totaled under Total Charges. If outside repair work is done on a job, such as machine shop work or any other concern it is charged for under "Other Charges."

I am sending this Service Order Form to you to use as you see fit, if you think passing it on to other members of the industry would help them, as I have had many compliments on the completeness of the form.

The initials in the space below the customer's name and address have the following code:

S. P.—Suction Pressure; H. P.—Head Pressure; C. I.—Cut-in setting of control; C. O.—Cut-out setting of control; T. E.—Temperature of evaporator; T. F.—Temperature of fixture; T. A.—Temperature of air (room temperature); T. W.—Temperature of cooling water; W. I.—Opening pressure of water valve; W. O.—Closing pressure of water valve; H. P. C. O.—High pressure cut-out setting; H. P. C. I.—High pressure control cut-in setting; C. P. S.—Control point setting (as on domestic controls), on-period of running time (average), off-period of idle time (average); Fuse—ampere rating.

Above these appear HH for Household job; COM for commercial job; AC for air conditioning job; APT for apartment house job; MIS for miscellaneous work; CHG for open account work; COD for a collect job; GUAR for work done under guarantee; POL for policy work done for promotional work; CON for contract service work; FS for work done on the job or field service; and SS for shop service work.

The bottom corner allows a record of hours put in and information as to when the customer requested the work done and when it was completed and delivered.

E. L. Gedney, Jr., Anderson, S. C.

WRAPPED IN CELLOPHANE

As the housewife buys frozen peas, and dodges the shelling, she can now buy frozen orange juice, and dodge the squeezing.

Orange juice is now being frozen in one-pound slabs by a Los Angeles company, and packaged for distribution in a fiber-board container. The company sells to frozen food distributors, adding another item to the rapidly growing stocks available in frozen food cabinets. Lemon and grapefruit juice are to be added to the list this winter.

Like milk, orange juice has to be frozen in from 20 to 30 minutes, to set the solids and eliminate the water. The frozen product is not competitive with fresh orange juice, but does meet a convenience demand.

"ENGINEERING SERVICE" FEATURED BY REDMOND

Redmond Company, Inc., manufacturer of small motors, is placing heavy emphasis on its newly expanded "customer engineering service."

Through closely coordinated sales and engineering activities, the engineering facilities of the company are being made available on a broad scale to manufacturers using Redmond Micromotors.

Small motors of the Redmond company, marketed under the trademark "Micromotors," are built in sizes up to $\frac{1}{2}$ H.P. for continuous duty on alternating current operation, and up to $\frac{1}{20}$ H.P. for direct current use.

WRIGHT CO. NAMED TO REPRESENT VIKING

Norman S. Wright & Co. has recently been appointed Pacific Coast representative of the Viking Air Conditioning Corp.

On machines using capillary tubes, when no replacement tubes are available, and the existing tube is plugged, discharge the unit and proceed as follows:

Disconnect the tube from the evaporator and connect it to a drum of methyl chloride or Freon-12. The use of the strainer on the other end will often facilitate this.

With the drum valve down, let the refrigerant into the capillary tube. Wait a few minutes. Then heat the capillary tube with a torch or very hot water, in a few minutes more the refrigerant will come through. Keep on heating the tube until a good flow is observed. Then, using the suction line, blow the oil out of the bottom of the evaporator through the capillary tube connection.

Finally, reassemble and recharge.
E. A. Wenk, New York City.

Electrimatic Regulating Valves

Automatic control and regulating valves for Freon, Methyl Chloride and Ammonia. A large variety of sizes and types available for practically any refrigeration requirement.



WL water regulating valves for Freon, Methyl, or Sulphur. $\frac{1}{2}$ " orifice and $\frac{1}{2}$ " FPT. Brass body construction. Large capacity—no chatter.



WP water regulating valves are available in $\frac{1}{2}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ " FPT sizes. Brass body construction for Freon, Methyl or Sulphur. Easy adjustment.



WK water regulating valves are De Luxe Pilot Operated Modulating valves. Iron body, simple adjustment. Available in sizes ranging from $\frac{1}{2}$ " to 2" FPT.



WR regulating valves for Ammonia are diaphragm operated and highest quality corrosion resistant materials are used. Available in sizes ranging from $\frac{1}{2}$ " to 2" FPT.

Electrimatic valves are individually tested for efficient, economical operation. Trouble free performance.

Ask for a copy of our latest catalog today.

Electrimatic

2100 INDIANA AVENUE
CHICAGO 16, ILL.



Over the COUNTER

(Editor's note: This is a continuation of the discussion, begun last month, of the apprenticeship-training program sponsored by the Veterans' Administration and its benefits to the refrigeration field as an additional source of manpower.)

JIM: *From what you've been telling me, Frank, I can easily see that through enlisting in the apprenticeship-training program we ought to be able to develop some men who'll make fine additions to our postwar business organizations. But, even though both we and the Veterans Administration exercise our best judgment in selecting men for work with us under the plan, now and then it's only to be expected that we'll come up with a fellow who doesn't fit in.*

What happens then—if we make a bad selection, and the veteran doesn't work out properly on the job, do we still have to keep him in our employ?

FRANK: Not at all. As a matter of fact, when a veteran is placed with your company under this arrangement, an agreement is drawn up that expressly states that, if the apprentice doesn't prove satisfactory, his job with you can be terminated. There are no strings tied to it, for you.

Regular "progress reports" are made, when you employ a man under this arrangement, so there's really not much chance of the situation getting too far out of hand before something can be done to correct it.

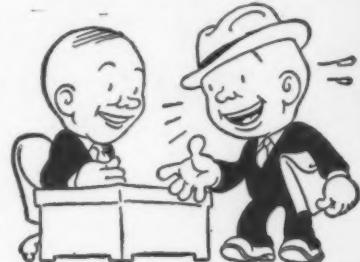
JIM: *That would protect us, then, if we happened to get a man who didn't work out properly.*

FRANK: Sure—and, at the same time, it gives the veteran in your employ a voice in the matter, too. If you're falling down on your part of the agreement as far as training or working conditions are concerned, the Veterans Administration finds that out through his

monthly reports to them.

JIM: *Oh, I see. Then the deal works both ways, doesn't it? That ought to make for a fair arrangement, and one that has a better than even chance of working out all right.*

FRANK: That's just the way it looks to me, too. You know, this apprentice-training program applies to all war veterans, and not only to those who may be physically handicapped by injuries received while



in the service. So, when you come to think of it, there's really a pretty wide field from which to pick.

Naturally, those men who are handicapped have to be picked with a specific job in mind, one that their condition permits them to do.

JIM: *I shouldn't imagine that would be so much of a problem; there are such a variety of jobs in refrigeration and air conditioning, and all of them require different capabilities.*

FRANK: The experience up to the present time has been that most all of these men are really interested in the job, and that they make a real effort to make good in the jobs they select. They know it's an opportunity for them, and they do all they can to make the most of it.

JIM: *Suppose we wanted to co-operate in this apprentice training program—how would we go about getting into it?*

FRANK: You simply make application to the Veterans Administration office nearest to you, and in-

dicate your willingness to employ and train a man capable and interested in doing the work involved. The Veterans Bureau representative then gets in touch with you, and explains the program in more detail so that you'll understand all about it.

JIM: *That seems simple enough. Looks to me as though all of us—jobbers, installation contractors, and service firms—ought to get a lot of good out of it. We're all in need of the right kind of men, and here's a real source of dependable workers.*

FRANK: Sure. We can all recruit some badly-needed manpower which will help us get back to a normal basis of operation, and besides, in the case of those veterans who have service-connected disabilities, we're giving them a chance to find a place in one of the fastest-growing and most promising industries in the country.

JIM: *You bet—all of us want to do everything we can to help these veterans re-locate themselves, both as a help to ourselves and as a patriotic duty.*

FRANK: Leaving the "duty" part out of it entirely, the whole arrangement as far as this apprentice-training program is concerned is strictly sound, from every angle. We need good men—and here's a place from which to get them. Companies in the refrigeration business who gets into the program now will have first chance at some mighty valuable men; the kind of men who'll occupy important places in their postwar sales and servicing organizations.

JIM: *I've given this thing a lot of thought, Frank, and it strikes me about the same as it does you. I think we'd be missing a real bet if we passed it up.*

FRANK: Now let's get down to cases. How's about posting a notice on our bulletin board, to tell our customers about this activity. Then we can have all our men tell our customers about this program in person when they call on them next time around the territory.

JIM: *For our own part, we'll want to register our name right off with the Veterans Administration, so that we'll be in line to get the pick of the men who are interested in getting into the refrigeration business as a permanent career.*

FRANK: The War Manpower Commission is taking an active part in this program, too, you know, as far as veterans who do not have service-connected disabilities are concerned. The WMC's Bureau of Training can help you out on details of the apprentice-training service if you want to go to your local office for the facts. My idea is to find out all I can about it.

JIM: *As far as veterans who have some service-connected disabilities are concerned, we have a number of jobs here that they could fill.*

Take jobs like stock clerks, order salesmen on the desk, bookkeepers, billers, just to name a few—a handicapped person can fit into those jobs as well as any other person.

FRANK: What you really mean is that, if the man is right, you can always find a place for him in your business, isn't that it? I think it's the same with any number of other companies in refrigeration.

JIM: *It certainly sounds to me like an A-1 solution to one of our biggest immediate problems, all right.*



The MARSH "Serviceman"

The "Serviceman" does what a pocket thermometer can't do. The remote reading feature permits tests under actual working conditions—with the refrigerator door closed and the indicator outside showing just what is going on at the point of measurement.

A generous length of capillary tubing is provided which coils handily into the back of the case, as illustrated, when the instrument is not in use. The Serviceman is a sturdy thermometer throughout, built to Marsh standards of precision and accuracy. The Marsh "Recalibrator" provides a convenient and certain means of keeping it accurate.

Here is the all-purpose thermometer for all domestic or commercial servicing. Volume production makes it possible to sell the Serviceman at the remarkably low dealer's net price of \$6.25 F.O.B. Chicago.

JAS. P. MARSH CORPORATION, 2880 Southport Avenue, Chicago 14, Illinois
Export Department: 135 East 44th Street, New York 17, N. Y.

MARSH *Refrigeration Instruments*

DEALER STILL CHOICE OF MOST PROSPECTS

Despite the fact that a great variety of retail outlets are apparently planning to carry electrical appliances, housewives intend to patronize chiefly the three big prewar sellers: appliance dealers, utilities, and department stores.

These indications were noted in a recent survey conducted for *Printer's Ink* magazine.

Questions asked for the survey were: "Which of these do you plan to buy? From what kind of dealer do you plan to buy?"

Answers on electric refrigerators revealed that 45.1% of those women questioned plan to make their purchase from a utility company; 20.9% from an appliance dealer; 17% from a department store; 12.1% from an electrical store; 2.5% from hardware stores; 3.6% from other outlets.

Appliance dealers are preferred by would-be buyers of home freezers, getting 35.2% of the votes. Utilities



are second with 22.4%; electrical stores, 20%; department stores, 11.2%; hardware stores, 1.6%.

The reasons for their preferences given by the women questioned were: (1) merchandise selections, (2) merchandise values, (3) merchandise reliability, and (4) good service.

NEW PLANT. Here is a view of the new \$175,000 plant acquired by Lau Blower Co. The new facilities will double Lau's great existing production capacity.

★ ★

NEW \$175,000 PLANT FOR LAU BLOWER

Lau Blower Co. has recently acquired a second building in Dayton, located just five blocks from its present plant, which, when readied for occupancy and full operation, will practically double the company's present manufacturing capacity.

The recently acquired two-story structure had been a war plant until the former tenant's government contract was terminated. The building interior had been modernized, including fluorescent lighting throughout, for efficient manufacturing. It has both railroad siding and trucking facilities.

This new \$175,000 plant expansion will greatly increase production and warehouse facilities of Lau Blower Co. and speed the firm's delivery service on standard equipment.

Lau recently made public the facts regarding its new postwar blower embodying many improvements, all of which are exclusive with Lau and all covered either by patents or patent applications.

Newest product is a blower wheel, details of which have not as yet been divulged, but which is claimed to be different from anything thus far placed upon the market.

This increased manufacturing capacity will further improve the company's competitive position in the industry, according to Ed Lau, president.

HAVERLY
MILK COOLER
Syracuse, N.Y.

Balanced And Controlled
•
Cork Insulated

There Is No Substitute For Experience

SELL HAVERLY
MORE PROFIT
LESS SERVICE
FOR BETTER CUSTOMER SATISFACTION
INQUIRE
HAVERLY ELECTRIC CO., INC.
1917 W. Fayette Street SYRACUSE, N.Y.

DISTRIBUTOR CORPORATION FORMED BY YORK

S. E. Lauer, president of York Corp., has announced the formation of York Distributors, Inc., a fully-owned subsidiary of York Corp., to provide complete sales, installation,

"JOB OPPORTUNITIES" BOOKLET

A booklet on "Job Opportunities for the War Veteran in the Air Conditioning and Refrigeration Industry" has been issued by Air Conditioning & Refrigerating Machinery Association, Washington, D. C. It is being distributed through veterans organizations and employment centers.

The booklet describes the general functions of refrigeration and air conditioning equipment, and lists job openings in the various branches of the industry and the broad qualifications required for each job type. Also listed is a partial list of schools offering training in refrigeration and air conditioning.

and service for York commercial air conditioning and refrigeration equipment in the New York area.

W. A. Pusch has been named president and treasurer of the new corporation. Other officers are R. C. Follett, vice president and sales man-

ager, and John F. Lebor, secretary. The board of directors is made up of Mr. Lauer, Mr. Pusch, E. A. Kleinschmidt, J. R. Hertzler and A. Christensen.

New and permanent offices are now under construction at 11-30 46th Road, Long Island City, and will be ready for occupancy around Jan. 1. Present temporary offices are at 41-11 28th St., Long Island City.

INSULATION RESEARCH

Plans for a new research center in

which expanded and accelerated development work will be carried on in the fields of building materials, insulations and other products urgently needed to help house the nation and increase efficiency of industrial operations in the postwar period, have been announced by Lewis H. Brown, president of Johns-Manville Corp. It is the first project announced in a company-wide expansion program in the United States, Canada and abroad which calls for the expenditure of approximately \$40,000,000 and which is hoped will provide 25% more jobs.

TOPS! for LOW TEMPERATURE



Maximum Refrigeration Efficiency

for all
REFRIGERATION
PURPOSES

Investigate . . . then you will specify . . . DOLE Vacuum Cold Plate Evaporators for maximum refrigeration efficiency.

See your Refrigeration Dealer

Dole Refrigerating Company

5910 N. Pulaski Rd., CHICAGO 30, ILL.
New York Branch:
103 Park Avenue, New York 17, N. Y.

NOW AVAILABLE! REFRIGERATOR HARDWARE

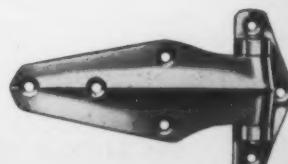
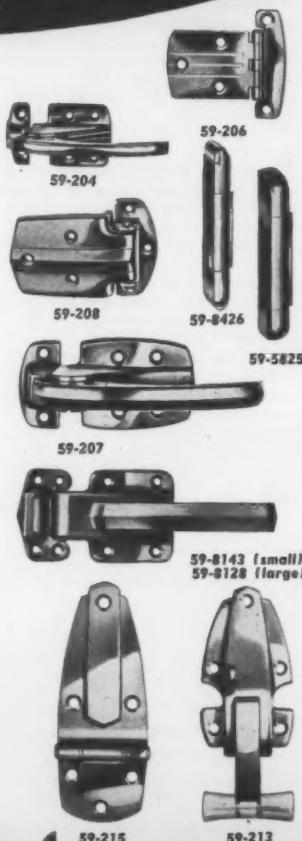
complete sets in
matching designs

An attractive set of stock Refrigerator Hardware is now available through your Jobber. This standard line will harmonize and be in good taste with the design of refrigerators, coolers and cabinets.

Because we are the largest manufacturer of Refrigerator Hard-

ware in this country, we are supplying your Jobber so he can serve you without delay.

Consult him for prices and other information.



Manufactured by
NATIONAL LOCK COMPANY
Refrigerator Hardware Division • Rockford, Illinois

3-way Protection

...at lower cost



with **CESCO'S**
No. 605 FUME KIT



CESCO'S Healthguard Fume Kit (No. 605) offers triple protection to refrigeration servicemen. Quick-change filter cartridges provide safety against ammonia, methyl-chloride and sulphur-dioxide fumes . . . all in one convenient kit. The soft molded rubber face-piece of the fume mask, and the instantly adjustable headgear assure a gastight, comfortable fit for every wearer. Large hardened safety glass lenses give perfect visibility.

The CESCO Healthguard Kit provides economical protection because it is moderately priced.

For full information, write for CESCO'S No. 605 Bulletin TODAY.



**CHICAGO
EYE SHIELD CO.**
2340 Warren Boulevard
Chicago 12, Illinois

CESCO
FOR SAFETY

CONTRACTORS

News • Activities • Plans

Selling Air Conditioning to Business and Industry

Comfort and industrial air conditioning is due for a huge uptrend in the coming months. All the desired equipment is not available right now, but in anticipation of the market it would be wise for contractors to develop a sound, clear understanding

ARMY TRANSPORTATION CORPS NEEDS REFRIGERATION MEN

The Transportation Corps of the War Department is in urgent need of maintenance and repair men for refrigeration equipment to serve as refrigeration engineers on Army vessels operating in the Pacific theater, reports Col. Alexander Corey, of the Transportation Corps.

Per annum salary is \$2550 base, plus subsistence and quarters at government expense and maritime bonuses applicable to the theater in which serving. This represents an additional increase of \$2.50 per day for each day of service in the area, plus a \$125 attack bonus, as may be applicable.

Further benefits include \$5000 war risk benefits free of premium for loss of life or disability, \$200 for loss of personal effects and up to \$200 extra for loss of professional equipment. Full rights and privileges under Civil Service also are provided. Interested persons are asked to communicate with the nearest Transportation Corps Port of Embarkation, listed below:

Boston—Essex Bldg., Boston 10; Hampton Roads—Norfolk Army Base, Norfolk, Va.; Los Angeles—Wilmington, Calif.; New Orleans—Poland & Dauphine Sts., New Orleans 12; New York—1st Ave. & 58th St., Brooklyn 9; San Francisco—Fort Mason, Calif.; Seattle—1519 S. Alaskan Way, Seattle 4.

of what the market is and how they fit into it.

Here's what one contractor reports:

"We have been receiving numerous inquiries as to installations in department stores, shoe stores, chain drug and grocery stores. Heretofore little thought was given comfort air conditioning by the chain stores in this part of the country, but constant promotion by manufacturers and need for comfort cooling for employees as well as customers now almost forces them to look at air conditioning as a necessity."

"Large industrial plants have discovered during the war the advantage of air conditioning their plants, making for better working conditions and a higher level of production. During the after-the-war period we firmly believe that 95% of all large modern industrial firms will install air conditioning."

Note that the old "dollars for you" motive still is strong. Doubtless it will continue, for some time to come, to be the dominant factor in selling to the commercial and industrial field. But it won't be much more important than your "selling" the customer on your ability to do the job right from an engineering and layout standpoint.

West Coast Commercial Firm Start Work on New Building

Construction of a new building with 100 foot frontage and 200 foot depth has been started by Wright Refrigeration Service, San Diego, Calif. commercial refrigeration firm. The firm, headed by Bob Wright, handles Hussmann meat cases, walk-in and reach-in units, Bastian-Blessing soda fountain equipment, home freezers and bar and store fixtures.

ELPECO Will Work Through Contractors

"Cafeteria style" merchandising, an innovation in the commercial refrigeration field, will help simplify the distribution of "Green Dragon" products when they start moving from the factory during the fourth quarter of this year.

M. E. Miller, president of Electric Power Equipment Corp., explained this program in announcing the policy of distribution to be followed by his company. "It will be a strict jobber policy," he stated, "with our production channeling through selected jobber outlets, and supported by a sales and service campaign in behalf of the independent service contractor."

The self-service plan is being inaugurated by Refrigerating & Power

Continued on page 66

BONNEY

"Versatile" SOCKETS

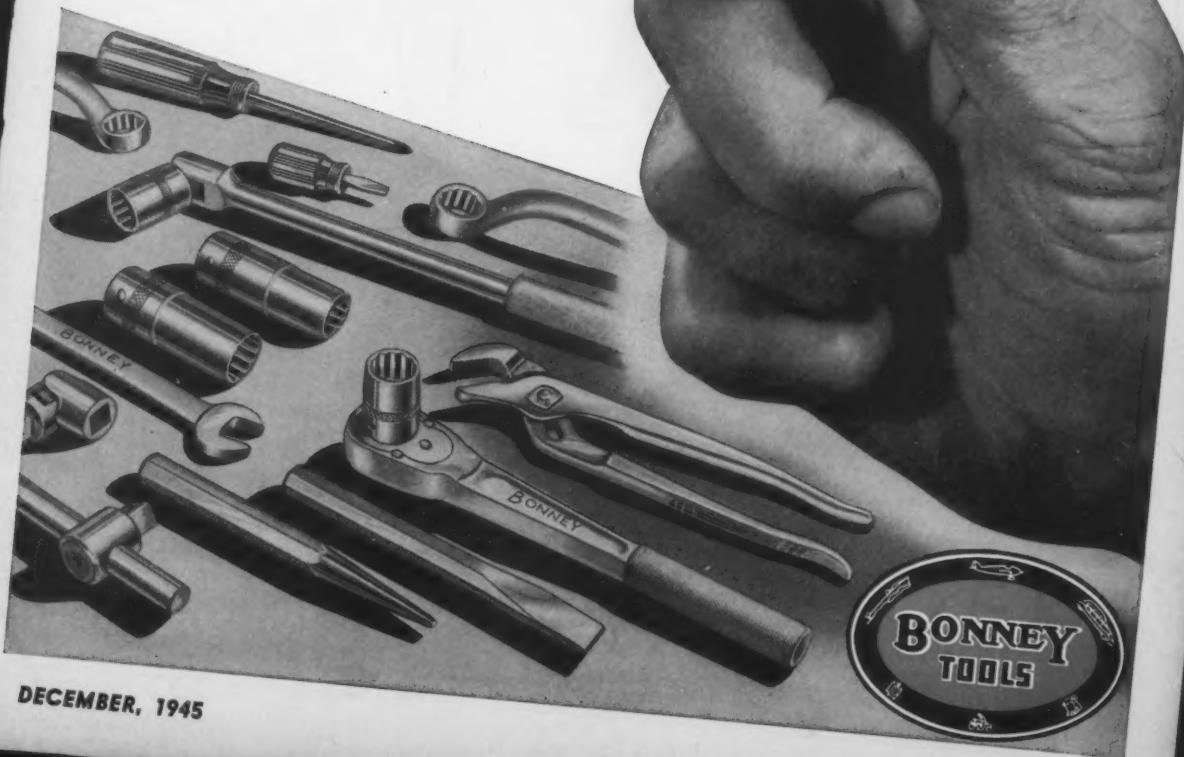
• Over 1000 combinations! Five drive sizes from $\frac{1}{4}$ " to 1"! With Bonney Sockets you can handle any nut-turning job in the books. And do it faster, better and easier too! Easy to attach and detach, each Bonney socket and attachment is designed, machined and heat treated to exacting specifications. For the easiest-working, longest lasting socket wrenches, see your nearby Bonney distributor or jobber.

BUY VICTORY BONDS AND KEEP THEM



BONNEY FORGE & TOOL WORKS
719 N. Meadow Street, Allentown, Pa.

In Canada: Gray-Bonney Tool Company, Ltd.
St. Clarens & Royce Aves., Toronto



DECEMBER, 1945

CONTRACTORS . . .

Continued from page 64

Specialties Co. of San Francisco, west coast jobber.

At the same time, the company has announced a new item, known as the "Thermotron." This, according to Mr. Miller, is an advanced type flow control instrument.

Need for Cooling in Drug Field Cited

Penicillin and many other important pharmaceuticals now in use may

deteriorate if not kept in a refrigerator, declares Dr. Arthur P. Wyss, dean of the School of Pharmacy, Western Reserve University, Cleveland.

"The need for refrigeration in the field of pharmacy has become increasingly important with the development of newer products and the increase in knowledge of some of the old drugs," he said.

"The alert pharmacist will provide adequate refrigerated space for these products, and it is his responsibility to instruct the users regarding the

proper storage conditions of such medications."

The degree of refrigeration which is preferable for a particular product may vary from almost a freezing temperature to one just slightly below average room temperature. Antitoxins, for example, are best kept at temperatures between 36 and 50°F. (2° and 10°C.) preferably at the lower limit, while it is more practical to store ointments and suppositories in an area just a little cooler than the average room temperature.

How Vitamins Keep

Certain vitamins in water solution, such as the members of the vitamin B complex, lose strength less readily if kept cold. Other products which benefit from storage under refrigeration include solution of magnesium citrate, fluid extract of ergot, various biologicals such as diphtheria and scarlet fever anti-toxins, epinephrine or adrenalin solutions, epinephrine, and all injections of insulin. Ointments, which depend upon the presence of animal fats or vegetable oils for penetration qualities, will develop rancidity less rapidly when stored under refrigeration.

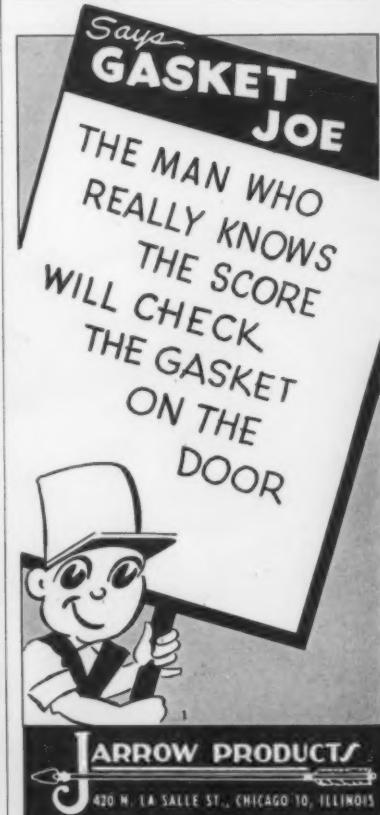
PETE and PAT . . . The PENN-TUBE Pals



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SEAMLESS REFRIGERATION TUBING
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MARSH EXPANDS SERVICE ON HEATING PRODUCTS

The Marsh Tritrol Co. has broadened its activities and will now distribute the heating specialties distributed by Jas. P. Marsh Corp. along with the Marsh Tritrol regulator. To better describe the broadened operations, the firm name is being changed to Marsh Heating Equipment Co. Main offices are located at 2122 Southport Ave., Chicago. James Emmett, Jr., will head the staff as vice president in charge of sales.

Purpose of the company is to combine the distribution of Marsh heating specialties and the Marsh Tritrol regulator—closely related products—so that a better engineering and consulting service can be rendered those who install or use these products.

WAY OPENED FOR GAINS IN ROOM COOLER USE

Resolution recommending to member-companies an increase in the permissible locked rotor currents to 40 amperes for residential service at 115 volts has been passed by the Edison Electric Institute and also by the Pennsylvania Electric Association.

This action resulted from the discussions of a joint committee of Edison Electric Institute and Air Condition-

BRITISH OVERSEAS AIRWAYS Corp. has reported plans for postwar development of their service facilities will include the use of quick-freezing apparatus to assure the provision of fresh foods for their passengers.

Company terminals in London and at overseas stations will be fitted out with low-temperature equipment, and pre-cooked quick-frozen meals will be taken aboard outgoing air liners to be stored in insulated containers.

After defrosting and heating, these complete fresh-food meals will be served to passengers, even on such long-route flights as that to Australia, the company explained.

Because of weight and space considerations, installation of a mechanically operated low temperature cabinet cannot be made in the plane.

ing and Refrigerating Machinery Association, covering particularly the installation of room air conditioners in residences. This type of connected load is expected to increase substantially over the next few years.

ACRMA is recommending to its member-companies that those air conditioners which do not meet the 40-ampere limit at lighting voltage be manufactured and installed for 230-volt operation.

U. S. GAUGE MOVES CHICAGO OFFICE

U. S. Gauge Co. announces the relocation of its Chicago office to the Monadnock Block, 53 Jackson Blvd. The Chicago office will be under the direction of Walter H. Magee, district sales manager.

CARRIER EARNINGS

Carrier Corp., in a report sent to stockholders, disclosed net profit carried to earned surplus for the twelve months ended Aug. 31, 1945, amounting to \$632,550. This includes carry-back tax refund of \$285,800.

As of Aug. 31, Carrier had a backlog of uncompleted sales amounting to \$12,130,313, the bulk of which is made up of orders for peacetime products and services.

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Kelvinator Household Units

Details of the four new 1946 model refrigerators with which the Kelvinator Division of Nash-Kelvinator Corp. launches a program calling for production of more than 1,100,000 appliances annually have been announced by Charles T. Lawson, vice-president in charge of Kelvinator sales.

The new Kelvinators—three 7-foot models and one 9-foot model—are featured by new interior and exterior



styling, greater provision for frozen food storage, and a number of mechanical and convenience developments. The three 7 cu. ft. models are now in production, and production of the 9 cu. ft. model will begin with the completion of tooling necessary for this new unit.

The new Kelvinator Moist Master, which tops the 1946 line, has special provisions for freezing and storing frozen foods, for the safe-keeping of foods of high moisture content, and for general storage of average foods. In effect a combination refrigerator and frozen food chest, the new unit has a freezer capacity of approximately 9 lbs. of ice cubes, and more than 35 lbs. of packaged frozen foods. Net capacity is 9 cu. ft. For the protection of high moisture foods, the "Cold Mist Freshener" feature of the

new unit employs a separate set of cooling coils concealed in the walls of the cabinet surrounding the compartment.

The CS-7, lowest-priced of the group, incorporating all of the basic Kelvinator engineering and 7 cu. ft. unit 12.2 sq. ft. of shelf area, a freezer compartment capacity of 9 lbs. of ice cubes, and 20 lbs. of packaged frozen foods. The C-7 has four additional features: vegetable crisper, sliding meat chest, with a capacity of up to 12 pounds, five-way "Magic Shelf" and 1 1/4-bu. vegetable bin. A third seven-foot model, the CD-7, has double crispers with glass covers, 13.1 sq. ft. of shelf space, and a freezer capacity of 9 lbs. of ice cubes and 30 lbs. of packaged frozen foods.

Kelvinator developments common to all of the new models include:

Welded steel cabinet, rust-proofed inside and out; Kelvatek insulation, sealed in; baked-on Permalux exterior finish; recessed, toe-room base; full cabinet-width doors; plastic inner-door seal; one piece, porcelain enameled interior with rounded corners and acid-resisting bottom; 13-setting temperature control; Freon-12 refrigerant; Polarsphere sealed condensing unit with a five-year protection plan on the mechanism; Cold-Ban flat surface door closure area; extra fast freezing; no-glare Polar light.

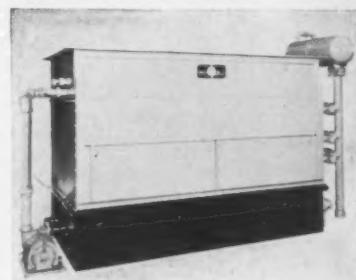
Industrial Liquid Cooler

A new industrial liquid cooler designed to furnish refrigerated water or any aqueous solution for practically all types of industrial uses has been announced by Niagara Blower Co., New York, N. Y.

The cooling water is sprayed over banks of coils in which the refrigerant is expanded, after which it falls into a tank and is recirculated independently of the distributing system. This is said to allow close control over temperatures and efficiency in heat transfer regardless of intermittent cooling operations or variations from maximum to minimum cooling

load. Newly developed coil arrangement and design are said to provide capacity increases of 50% to 100% over the company's previous equipment in comparable sizes.

It is possible to produce 33° water constantly without danger of damage from freezing, the company claims, as the system is open and does not depend for safety on the proper functioning of the back pressure regulat-

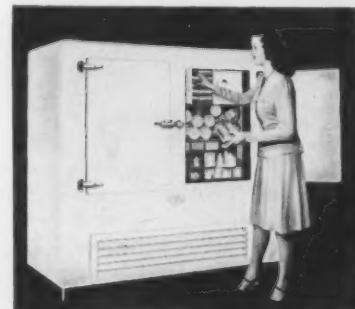


ing valve. To provide temperatures below freezing, the coolers may be operated with Niagara "No Frost" liquid solution.

Range of capacities in different sizes runs from 4.7 to 137 tons refrigeration. The model rated at 137 tons is 105" long by 88" high by 60" wide. Water deliveries range from 11 to 220 gallons per minute.

Upright Farm-Home Locker

Just announced by Tyler Fixture Corp., Niles, Mich., is a new Harder-freez 18 cu. ft. upright farm and home locker unit. The new unit is available in two models: Model HU-18F, an all-frozen-food refrigerator with separator processing compartment; and Model HU-18D, a dual-purpose unit, with 9 cu. ft. of frozen



food storage and a 9-cu. ft. normal temperature compartment.

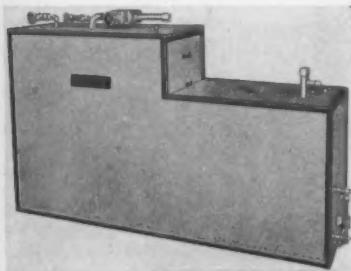
Cabinets are hermetically sealed to eliminate infiltration of moisture, and have 5 inches of insulation, said to be 25% more than is usually used in cabinets of this type. Cabinets

are of all welded steel construction.

Other units in the Tyler low temperature line include a 12-cu. ft. chest type unit, and a 190-cu. ft. walk-in unit which may be erected sectionally in basements or service rooms. Half of this larger unit is designed for low temperature storage and half for normal temperature use.

Water Cooling Units

A new line of commercial and industrial water cooling units has been announced by Buildice Co., Inc., Chicago. Designed for a variety of applications, the units feature a special type of header construction which is said to allow placing of coils on very close centers, eliminating necessity of drip strips. Headers are designed with internal baffles to direct the flow of



liquid and gas in units. Coils, headers and connections are all welded and tested to 350 lbs. pressure.

Water tank consists of an inside and outside steel tank with insulation between the two. Inside tank is coated with bitumastic paint and is painted aluminum color; outside tank is finished with two coats to white enamel, trimmed in black. Covers are of carefully fitted wood, water-proofed and designed to be removable.

New Rivnut Use

A new use for the Rivnut, in the refrigeration industry, is reported by B. F. Goodrich Co., developer of the one-piece internally threaded and counterbored tubular rivet which can be used as a blind rivet, nut plate for attachment, or both, and can be headed or upset with a simple tool.

One of the country's leading refrigerator makers will use 28 Rivnuts on each unit as a nutplate for the attachment of shelves. The Rivnut will be upset in a finished porcelainized inner shell, where conventional riveting cannot be used because the bucking action would crack the porcelain finish.

Cooling-Heating Unit

"Reversatemp", a fully automatic unit which keeps room temperatures constant despite outside weather conditions, alternating between heating and cooling as necessary, has been introduced by Drayer & Hanson, Los Angeles.

According to the manufacturer, the original cost and operating expense are less than the commonly used combination of combustion heating and compression refrigeration systems. Smallest "Reversatemp" unit fits into a 3½' x 5' x 7' high space;

sizes cover a wide range of application requirements.

Crosley Household Units

Production has been started on two models by Crosley Corp., reports R. C. Cosgrove, vice president and general manager. The limitation on number of models has been done to make available as many units as possible at the earliest possible moment.

Leading Crosley feature continues to be the Shelvador, application of which has been refined and improved in the new units, which are classed

**"JUST OPEN
THE VALVES
AND
PLUG IT IN"**

Designed for

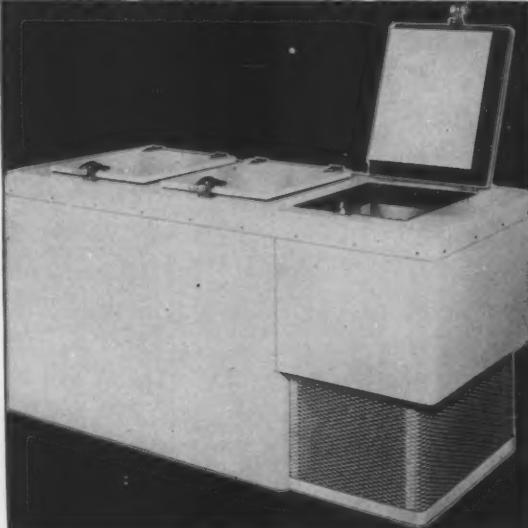
**DUAL
PURPOSE
FREEZING**

Features

- 1 Refrigerant—Methyl Chloride Free when available with either complete refrigerated liner or plate coils, contingent on market availability.
- 2 Motor $\frac{1}{2}$ H.P. 110-220 A.C. Note: Shipped for 110 A.C. Single Phase 60 Cycle.
- 3 6 Ft. Plug-In Cord.
- 4 Insulation: Bottom, Sides and Top 5" Approved.
- 5 Doors Equipped with Molded Rubber Baskets.
- 6 Hardware—Snap Lock with Padlock Hole for Protection.
- 7 Finish—Baked White Enamel.
- 8 Control—Thermostat.
- 9 Shipping Weight (Crated) 750 Lbs.
- 10 All Joints Sealed with barriers against vapor transmission.
- 11 Meat capacity—Approx. 500 to 600 Lbs. contingent on cuts and wrapping.

Prices and specifications subject to change without notice. Government regulations complied with.

AMERICAN
Farm and Home Freezer
★ **QUALITY** ★
PERFORMANCE ★ DEPENDABILITY



A dual purpose unit with one compartment for quick freezing and other for storage. Shipped for 110 A.C. single phase 60 cycle. Handsome baked white enamel finish. Cabinet shipped with compressor set for -15°F . in quick freeze compartment and 0° in storage compartment. Economical to operate. Send for folder and prices.

We manufacture a complete line of Walk-in Coolers. Also 6', 8', 10' and 12' Beverage Coolers. Milk Coolers and Low Temperature Cabinets in 8, 15, 22 and 30 cubic foot sizes. Will send full information on request.



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FREON 22**

as 1945 models by the company. Models in the new line have oversized freezers, with frozen food storage space, and the porcelain meat chest will hold from 10 to 14 lbs. of meat.

The "Electro-Saver" hermetically-sealed refrigerating unit continues as a feature, and 10-point temperature control is provided. In addition to



the Shelvador, five food shelves are inside the cabinet. One-piece molded plastic door trim is used to provide more efficient seal, and deluxe models have a "pull-tight" positive seal door latch with plastic and chrome handle.

NEW '45 EDITION



Only \$2.00 Written by H. P. Manly, refrigeration authority, this NEW book covers refrigeration problems in conversational language so that its 300 pages and 138 diagrams and illustrations can't miss being a real HELP TO YOU. Covers practically every operation in field service and shop operations which may be required. Includes domestic types of refrigeration, and fully and completely explains the commercial types in small and medium sizes, such as used in markets, milk depots, soda fountains, flower shops, etc., as well as in many air conditioning systems.

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The new '45 Refrigeration Service Manual covers repairs and maintenance of gas refrigerators and systems . . . Only leaves nothing to doubt . . . explained clearly and concisely. **\$2.00**

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Cabinets are bonderized and finished in Dulux.

The deluxe model, SE-746, has net food storage capacity of 7.3 cu. ft. and shelf area (Nema rating) of 13.81 sq. ft. Ice capacity is 112 cubes (12 lbs.) per freezing. Second model, the SS-746, has the same food capacity and shelf area, and makes 77 ice cubes (8 lbs.) per freezing. Over-all cabinet dimensions of both units are the same. The deluxe model also has a vegetable dry storage bin in the cabinet base, and two sliding, glass-top vegetable crispers inside the cabinet.

Thermostatic Expansion Valve

Tenney Engineering, Inc., Newark, N. J., has announced a new thermostatic expansion valve for regulating refrigerant flow into an evaporator.

The new valve, Model TS-1, is designed for standard commercial use, such as air conditioning, display cases, refrigerator boxes, etc. Other models for air conditioning and low temperature use will be announced later.

The valve can be taken apart and reassembled easily for cleaning. A number of other features are claimed.

Use of a feeler bulb is eliminated. The valve is not affected by box tem-



perature, entering warm air, or warm suction lines, and responds instantaneously to changes in suction vapor conditions. Sizing the valve to the job, normally done to prevent "hunting", is unnecessary, it is claimed, due to the absence of any appreciable time lag in control.

With the new valve, extremely close super heat control (such as 50°F. super heat with plus or minus 1/2°F. for control) can be maintained, it is claimed. It is particularly adaptable to modern evaporators with forced

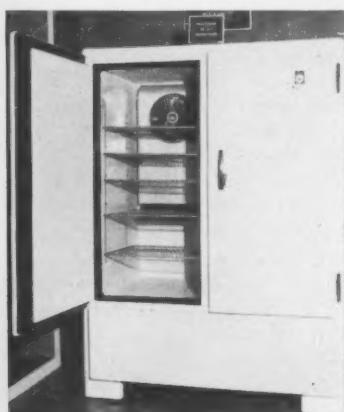
air, small tubes, short passes and distributor header combinations, and to small evaporators or modern close coupled coil and machine combinations.

Claimed as another feature of the new valve is its elimination of need for special "charging" and "cross-charging" to assure operation in a specific temperature range. No special installation is required to prevent loss of control caused by condensing of bulb control fluid in valve body, it is said. Use of an external equalizer is said to be unnecessary, as compensation for pressure drop in evaporator or distributor has been designed right into the valve itself. No stem packing is required. Needle and seat design is said to assure positive closure.

Frigidaire Commercial Line

Frigidaire Division, General Motors Corp., has added a complete line of refrigerated cases and fixtures to its commercial refrigeration products.

At present six models of reach-in refrigerators are planned, and will be available to the public in December. They include the 20, 30, 50 and 60 cu. ft. models with forced-air cooling



units, and the 20 and 30 cu. ft. models with ice-making cooling units.

The Frigidaire cases will be initially available in 10 styles and sizes after Jan. 1. Display cases of the single-duty type will be manufactured in 10 and 12-ft. lengths; while double-duty cases will be available in 6, 8, 10 and 12-ft. lengths. A 6-ft. length, full-vision case for dairy and delicatessen usage will also be made; as will a double-duty vegetable case in an 8-ft. length.

DECEMBER, 1945

Finger Tool

"Touch-n-Grip", a small compact tool enabling the user to reach into snug or invisible working areas to touch and grip the work spot instantly and hold the nut, bolt or screw in fixed position, has been developed by Faso Mfg. Co., Long Island, N. Y.

The tool is worn like a ring, and does not restrict the free motion of the hands or fingers. When not in use, it can be turned around the finger and out of the way to leave the hands free for using other tools. Contact end of the tool is magnetized

to hold the work in position.

Pipe Sealing Compound

"Black Magic", a pipe sealing compound and gasket cement for use with gasoline, oil and other petroleum base solvents, has been announced by Bowser, Inc., Fort Wayne, Ind.

The compound is said to form a permanent seal in pipe joint or gasket, but to retain enough flexibility to permit expansion and contraction of metals without cracking. It is also said to resist brittleness after long use.

A QUICK GUIDE TO MOTOR-START CAPACITOR REPLACEMENTS

SPRAGUE UNIVERSAL ELECTROLYTIC CAPACITORS FOR CAPACITOR START MOTORS

Motor Rating H. P.	Motor Speeds	Typical Capacity Rating	Sprague Part Numbers	List Price
1/6	3450-1725-1140	75-84 mfd.	A3505	\$1.60
1/6	3450-1725-1140	85-96 mfd.	A3506	1.65
1/4	3450-1725-1140	108-120 mfd. 124-138 mfd.	A3507* A3508	1.70 1.80
1/2	3450-1725-1140	161-180 mfd.	A3510	2.40
1/2	3450-1725-1140	216-240 mfd.	A3511	3.25
3/4	3450-1725-1140	378-420 mfd.	A3513	5.40
1	3450-1725-1140	378-420 mfd.	A3513	5.40

*There are some 1/6 H. P. motors of special design which may require a capacitor of 108 to 120 mfd. such as Sprague Catalogue No. A3507. It is always possible to use A3508 as a replacement for these units.

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Here you see how *only eight* of the small Sprague UNIVERSAL Capacitor types enable you to handle almost any standard motor-start replacement—quicker, easier, more dependably and often at less cost. Other types simplify replacements for permanent split-phase capacitor motors to an equal extent. Write today for Sprague Bulletin C-356 giving you the complete story of why it will pay you to standardize on Sprague UNIVERSALS for **EVERY** job.

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SPRAGUE Universal MOTOR-START CAPACITORS

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There are at present over 43 different models of ELASTIC SLEEVE SEALS, embodying the following features, that have been developed for the refrigeration industry.

- Has no fragile parts to break.
- Works well on worn and pitted shafts.
- Eliminates springs.
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- Is easy to install as a replacement seal.
- Can be adapted to cure your seal problems.

Complete specifications and prices on THE ELASTIC SLEEVE SEALS that are now available may be found in our new price list and specification folder. Additional ELASTIC SLEEVE SEALS are being introduced constantly and by spring the line will be complete for all makes of refrigerators.

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COMMERCIAL APPLICATION AND SERVICE ENGINEERS. Large refrigeration firm with growing export business has openings in several territories for qualified refrigeration application and service engineers. Knowledge foreign languages helpful. Write giving full details, experience and references. Box 2245, Refrigeration Industry.

COMMERCIAL REFRIGERATION service man. Exceptional opportunity, permanent position. Hourly rate plus commission, car allowance and profit-sharing arrangement. Must have ability and experience in servicing industrial, commercial and air conditioning equipment. We are a well-established firm located in northern Ohio. Box 8452, Refrigeration Industry.

SERVICE MANAGER with ability to organize service department and train men for organization engaged in domestic and commercial refrigeration, covering 17 Northern Ohio counties. Ample facilities to create outstanding department. State full particulars and salary requirements in first letter. Box 8458 Refrigeration Industry.

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SERVICE ORGANIZATION in northern New Jersey desires connection with manufacturer or distributor on service and installation of commercial refrigeration equipment, at present authorized service for one of the largest manufacturers of domestic refrigerators and room coolers. Box 1145, The Refrigeration Industry.

Established Sales and Service organization, Miami, Florida desires connection with manufacturer or distributor of high and low temperature commercial and domestic refrigeration and air-conditioning equipment. Box 2145, The Refrigeration Industry.

FOR SALE

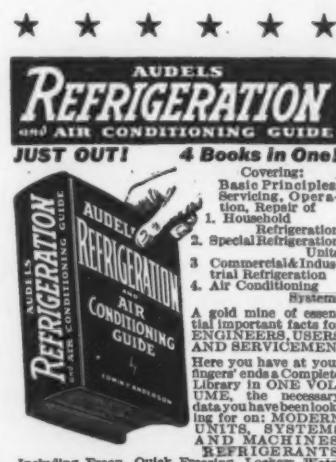
For Sale. Remanufactured air and water-cooled condensing units $\frac{1}{4}$ H.P. up to $\frac{1}{2}$ H.P. Frosted Food & Ice Cream Cabinets. Edison Cooling Corp., 310 East 149th St., New York 51, N.Y.

FOR SALE—12-16 and 24 cubic ft. freezer cabinets. Write for list and prices. Rathbun Refrigeration Company, 1675 Lake Drive, Grand Rapids 6, Michigan.

MINNEAPOLIS-HONEYWELL NINE-MONTH EARNINGS

Minneapolis-Honeywell Regulator Co. reports for the nine months ended Sept. 30, 1945, after reserves for taxes, net income of \$2,404,991. This is equivalent after preferred dividends to \$1.72 per share on 1,243,800 shares of common stock outstanding. Net income for the similar period of 1944 was \$2,283,940 or \$1.65 per share.

For the three months ended Sept. 30, the company reports net income of \$510,600 or \$.34 per common share after preferred dividends. Net income for the like quarter of 1944 was \$654,435 or \$.46 per share.



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SCHENECTADY DEALER BUYS NEW BUILDING

ABC Refrigeration Sales and Service, Schenectady, N.Y., has purchased a two-story brick building at Smith St. and Broadway and an adjoining frame building as the first step in its postwar expansion plans. Work of remodeling the brick building will be started about April, reports Albert Zalutsky.



**"FRACTIONAL TONNAGE
A-P VALVES FIT LOW
TEMPERATURE WORK
WITHOUT HUNTING
OR STARVING...!"**

EXPERIENCED REFRIGERATION SERVICE

Engineers like Mr. A. L. Robertson, of the Refrigeration Maintenance Company, Madison, Wis., give full credit to "A-P Dependable" Refrigerant Valves for their special adaptation to low temperature work. They find that "A-P" fractional tonnage sizes for Freon or Methyl Chloride refrigerant applications make it easier, as Mr. Robertson states, to fit the job without necessity of "hunting" or "starving" the line.

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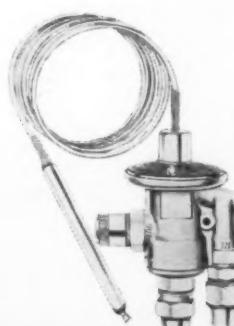
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We use and like A-P Valves especially on low temperature work. We like the fractional tonnage sizes because we can better fit the job without hunting or starving.

Yours very truly,
Archie
A. L. Robertson



A-P Model 205 Thermostatic Expansion Valve. Capacity, up to 1 ton Freon.

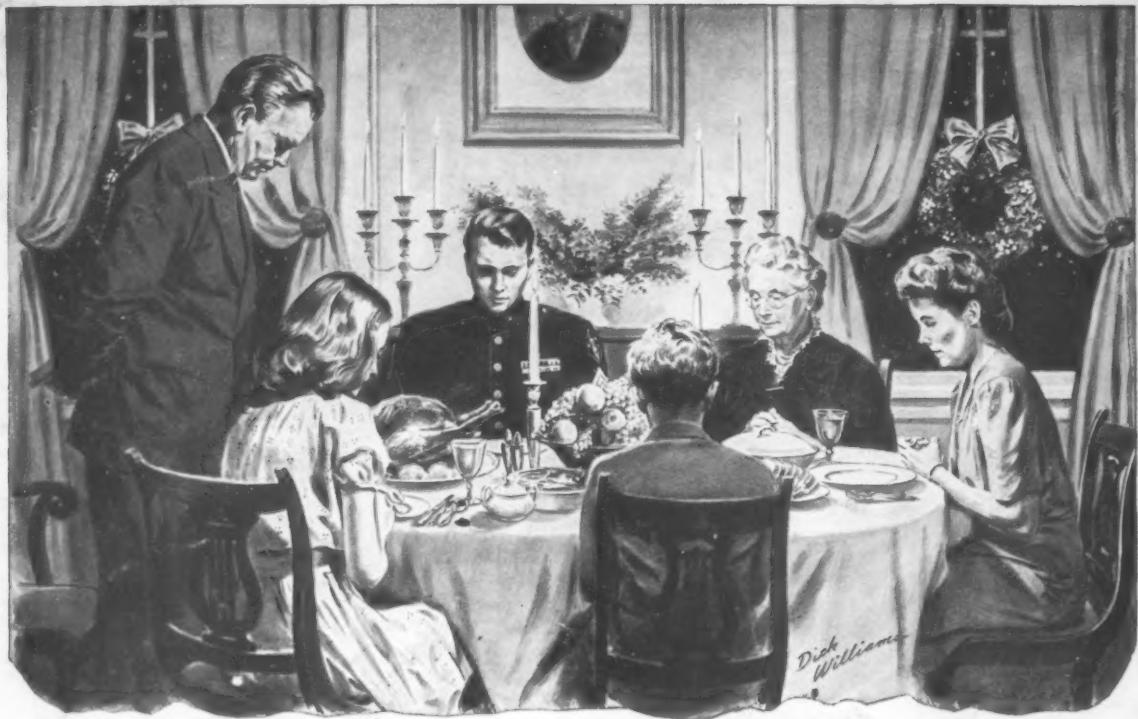
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What's the other thing we ought to do this Christmas?

FOR the last four years, the Christmas phrase "Peace on earth, good will to man" has had a pretty hollow, bitter ring.

This year, it won't.

And surely, one thing each of us will want to do this Christmas is to give thanks that peace has finally come to us—both peace and victory.

One other thing we ought to do:

In our giving, this year, let's choose—first—the kind of gift that helped to bring us peace and victory and will now help us to enjoy them.

★

Victory Bonds take care of the men who fought for us—provide money to heal them, to give them a fresh start in the country they saved.

Victory Bonds help to insure a

sound, prosperous country for us all to live and work in.

Victory Bonds mean protection in emergencies—and extra cash for things we want to do ten years from now.

Choose—first—the finest gift in all the world, this Christmas.

Give Victory Bonds!

Give the finest gift of all—VICTORY BONDS!

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